Wonderware® FactorySuite™

System Administrator's Guide

Revision A
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Trademarks

Contents

Before You Begin

This guide provides an overview of the FactorySuite, including what you need before you start installing, how to install and network the various components, and how you can set them up to share data. This guide also provides high-level information on maintenance and diagnostics, as well as implementing security for different components.

This guide is written for the system administrator of the FactorySuite system. It is assumed that the reader of this guide is familiar with the Windows NT operating system for both Server and Workstation, as well as general networking concepts, such as protocols, clients, servers, and so on. The purpose of this guide is to help you get all of the components installed and running properly and provide high-level information on how you can further integrate them.

Detailed information on using individual FactorySuite components is not included in this guide. Refer to your documentation set for that component for more information. A list of FactorySuite guides appears in Appendix A.

Document Conventions

This manual uses the following documentation conventions:

Convention	Designates
UPPERCASE	Industrial-SQL, paths, filenames, and syntax.
MIXEDcase	Syntax abbreviations. The uppercase segment is required. The lowercase segment is optional.
SMALL CAPITALS	Keyboard names, such as ESC.
bold	System procedures, utility programs, commands, and user-entered text.
italic	Database names, table names, column names, index names, and tags.
`monospace`	Display text, error messages, and examples.
{braces}	Required items in syntax. Do not type the braces in the syntax.
[brackets]	Optional items in syntax. Do not type the brackets in the syntax.
| (vertical bar)	The meaning "or." In syntax, you can use only one of the items on either side of the vertical bar.
... (ellipsis)	The previous syntax item can be repeated.

CHAPTER 1

Introduction

This chapter describes the Wonderware® FactorySuite™ and provides an brief overview of each of the FactorySuite products.

Contents

About the FactorySuite

Running a factory is more than the people, material and equipment on your plant floor. It's information management. Finding the answers to day-to-day questions like: Where and why did that bottleneck occur? Were the production costs equal to the planned costs? Did we meet expected yield? What caused the delays? What's causing this temperature spike in the pressure vessel? Am I wasting material? Did we meet our Production Schedule? Information is the key to improving product quality, maximizing production efficiency and preserving capital investment in your plant.

FactorySuite™ 2000 is the world's first integrated, component-based MMI *System.* With FactorySuite 2000, you have access to all the information you need to run your factory. Today, it's not enough to buy just a database. Or just an MMI. You need all the pieces-- visualization, optimization and control, plant floor data collection, and data storage and analysis -- to make your plant truly productive. And FactorySuite 2000 can give you a powerful manufacturing and management information system.

The FactorySuite allows you to collect, view, store, control, analyze and manage the information from your plant floor. FactorySuite 2000 runs on the Microsoft® Windows NT™ 4.0 operating system and the MMI and clients run on the Windows 95 operating system. FactorySuite 2000 sets a new standard for what you should expect in a comprehensive MMI system. Included in the FactorySuite are core components that provide basic system services:

- InTouch™, the world's leading MMI for visualization;
- InControl™ for Windows NT-based machine and process control;
- IndustrialSQL™ Server, the first real-time relational database for the plant floor;
- Scout™, a robust Internet/Intranet tool for remote data viewing.

Also included are base "application" components:

- InTrack™ for resource management;
- InBatch™ for flexible batch management.

Plus all Wonderware I/O servers to connect FactorySuite 2000 to the data on the plant floor.

InTouch

Wonderware InTouch, the world's leading MMI, provides a single integrated view of all your control and information resources. InTouch enables engineers, supervisors, managers and operators to view and interact with the workings of an entire operation through graphical representations of their production processes. Version 7.0 for Windows NT 4.0 and Windows 95 includes a host of new and updated features including remote tag referencing, ActiveX support, distributed alarm handling, distributed historical data with IndustrialSQL Server, updated user interface, QuickFunctions and SuperTags. Additionally, the network application development environment allows systems to be developed for use in large PC-based networks. InTouch's legendary ease-of-use and power dramatically reduce the cost and time associated with deploying and maintaining operator interface/MMI systems.

Included with InTouch is FactoryFocus™, a powerful, view-only node that enables supervisors and managers to view real-time plant floor data from a desktop PC anywhere on the network. InTouch 7.0 also contains the Wonderware Productivity Pack, which includes WizGen™, a handy software tool that helps users to develop custom wizards. The Productivity Pack has more than 2,000 wizards that make application development easier than ever before and also includes a 16-pen trend.

Performance Features

Performance features are:

- **Object-Oriented Graphics.** Easy-to-configure applications mean faster development times. Objects and groups of objects can be moved, sized and animated quickly and easily. Powerful object-oriented design tools make it easy to draw, arrange, align, layer, space, rotate, invert, duplicate, cut, copy , paste and erase objects. InTouch now supports Microsoft's powerful standard ActiveX technology, allowing standard ActiveX objects to be used with InTouch. InTouch supports any video resolution supported by Windows, and multi-monitor configurations are supported.
- **Animation Links.** Animation links may be combined to provide complex size, color, movement, and/or position changes. Animation links include discrete, analog and string touch inputs; horizontal and vertical sliders; discrete and action push buttons; show and hide window push buttons; line, fill and text color links for discrete and analog values and alarms; object height and width links; vertical and horizontal position links, rotational links, and more.
- **Distributed Alarming.** This capability supports multiple alarm servers or 'providers' simultaneously, which gives operators the ability to view alarm information from multiple remote locations at the same time. The distributed alarm functions let users implement 'point-and-click' alarm acknowledgment, alarm scroll bars and many other features for networked use.
- **Distributed Historical Trending.** InTouch allows you to dynamically specify different historical file data sources for each of the pens on a trend chart. These historical file sources can be other InTouch databases or any IndustrialSQL Server database. Since InTouch permits the use of up to 16 pens per trend chart, users can have an unprecedented amount of historical data available for viewing at any given time.

New in FactorySuite 2000

The following features are new for FactorySuite 2000:

- **Application Explorer.** InTouch 7.0 includes the powerful Application Explorer. The Application Explorer is a hierarchical display of the component objects that make up the InTouch application. It allows for quick, easy and intuitive access to all application parameters including: Windows, QuickScripts, Configuration, Tagname Dictionary, Tagname Cross Reference information, SuperTag template maker, SQL Access, SPC or SPC Pro, Recipe and more. The Application Explorer enables any Windows application to be launched from within InTouch WindowMaker, such as other FactorySuite components, Microsoft Word or Excel, or third party PLC programming packages. This allows WindowMaker to become the central development tool for an entire automation application.
- **Remote Tag Referencing.** InTouch 7.0 allows remote tag referencing, which is the ability for InTouch to directly link to and display real-time information in any remote data source without requiring a local tag to be constructed. These sources include other InTouch nodes, InControl nodes, InBatch nodes, and any DDE or NetDDE™ data source. Remote tag referencing enables the development of distributed client/server applications, saving enormous amounts of time in application configuration and maintenance.
- **QuickScripts.** InTouch's scripting language, QuickScript, is so powerful, flexible and easy to use that you can create scripts by point-and-click alone without ever touching the keyboard. QuickScript allows custom functions, QuickFunctions, to be created in the same easy-to-use environment. QuickFunctions can be used just like built-in functions, allowing custom QuickScript extensions to be developed on the fly. And QuickFunctions can be configured to run on their own thread.
- **SuperTags.** In version 7.0, InTouch supports SuperTags, which are hierarchical organizations of tags that allow the mapping of specific real world devices, DCS style tags and PLC data structures into InTouch. SuperTag structures can be custom defined by the developer, allowing for the logical grouping and handling of related information while saving valuable development time.
- **OPC Support.** Version 7.0 of InTouch, as well as the rest of the FactorySuite, fully supports the OPC (OLE for process control) standard. This allows any FactorySuite application to have access to data provided by any OPC server. OPC Client support extends Wonderware's commitment to open connectivity standards and communications to the largest number of industrial automation devices available.
- **SuiteLink.** All components of FactorySuite 2000 support Wonderware's new communications protocol, SuiteLink™. SuiteLink provides time and quality stamped data, ensuring the absolute integrity of all data for SuiteLink or OPC sources. Additionally, SuiteLink has been optimized for high speed, distributed application development communications on large networks. Legacy applications are still supported using DDE or FastDDE.
- **SPC Pro.** SPC Pro™ extends the functionality and ease of use of FactorySuite's traditional SPC by providing powerful new on-line statistical analysis tools that help users to achieve better product and process quality, reduce costs and increase yields. SPC Pro's high-configurable control and defect charts (EWMA, CuSum, u-chart, n-chart) monitor and track variation and defects over time. Designed to work as an on-line quality improvement tool for short, long, and continuous runs, SPC Pro features individual alarms to help users to quickly identify which statistical rules were violated. Users can track corrective actions, delete and modify samples, set limits and add special causes on the fly. The standard version of SPC is shipped with InTouch 7.0 and is a subset of SPC Pro; it does not include these new features. For SPC Pro functionality, a separate license is required.

FactorySuite I/O Servers

If you can't connect to data devices, what can you accomplish? Not much. That's why FactorySuite 2000 includes the widest selection of I/O servers for connecting to control devices including Allen-Bradley, Siemens, Modicon, Opto 22, Square D and others. FactorySuite 2000 I/O Servers provide quality information and time stamp for each individual data point. This further improves the capabilities of Wonderware's alarm management and historical archiving (IndustrialSQL Server).

In addition, there is a broad range of servers available from third parties. A current listing of servers is available on Wonderware's Internet web site at http://www.wonderware.com. Our FactorySuite Toolkit also includes a server development kit that lets you develop servers for new or custom devices.

A new OPC (OLE for Process Control) interface enables communications with both in-process and out-of-process OPC servers. It is also possible to remotely browse the name space of OPC servers, thus facilitating the setup of OPC communications even over the network.

IndustrialSQL Server

Wonderware IndustrialSQL Server is the world's first high- performance real-time relational database for factory data. It combines the power and flexibility of a relational database with the speed and compression of a real-time system to integrate the office with the factory floor. Unlike other Process Information Management Systems, IndustrialSQL Server embeds Microsoft SQL Server™, providing universal data access, a powerful relational engine, and tight integration with Microsoft BackOffice™.

IndustrialSQL Server acquires and stores plant data at full resolution and integrates real-time and historic plant data with configuration, event, summary and production data. Access to complete plant information is available through hundreds of client applications, ensuring a level of openness and flexibility unmatched in the industrial software arena. Factory data can now be visualized, analyzed and reported across the enterprise – truly linking the office with the factory floor for the first time!

Performance Features

Performance features are:

- **Universal Data Access.** Engineers, maintenance managers and plant floor operators can view, analyze and present real-time, historical and configuration data with the software of their **choice. This includes Wonderware clients like FactoryOffice, InTouch and Scout, commercial software like Microsoft Office, and hundreds of specialized and custom tools using SQL or OBDC.**
- **Ease of Use.** IndustrialSQL Server is automatically configured using InTouch configuration information, reducing implementation time to minutes. Users and administrators of IndustrialSQL Server require *no* knowledge of SQL, accelerating the payback of "factory information at your fingertips".
- **Relational Query Engine.** IndustrialSQL Server's query engine is the most powerful in the business, enabling users to search for and find data in order to understand the complex relationships and correlations between physical plant, manufacturing operating conditions, process events, product quality and production efficiency.

New In FactorySuite 2000

The following features are new for FactorySuite 2000:

- **Event System.** IndustrialSQL Server's new event system addresses batch and discrete industry requirements. Events can be detected by IndustrialSQL Server, or by external applications like InTouch or InControl. Actions harness the power of BackOffice, and include reporting, publishing on the Internet, and sending e-mail.
- **SuiteLink Support.** IndustrialSQL Server's support for Wonderware's new SuiteLink I/O servers enables time and quality stamping at the data acquisition level, ensuring the highest quality data.
- **Dynamic High Resolution Storage.** The new delta analog storage engine can store data with a 3 msec resolution, essential for faster process measurements such as vibration measurements. The storage engine is dynamically configurable, allowing high-speed storage to be initiated in response to a process event.

- **FactoryOffice™.** FactoryOffice is a pack of client applications for use on the desktop. Anyone involved in the production process can view, graph and analyze IndustrialSQL Server data without prior knowledge of SQL. The tools can be deployed on any Windows 95 or Windows NT computer connected to a local or wide area network. FactoryOffice includes Trend "client" for graphing tags over time, Vector "client" for XY plots, and QuickLook "client" for viewing tabular current data.
    - **Powerful Visualization and Analysis Capabilities.** Display real-time and historic trends of analog, discrete, and event data on the same graph. Compare tags over time with the powerful multiple time scale functionality. Bookmark and annotate interesting data, and calculate and display statistics. Define operating regions and monitor process behavior with Vector's XY graphing features.
    - **Ease of Use.** Drag a Factory Object like a pump from the tree control to the graph area to view its tags over time. Point and click on the time control to select the time scales. Or use ActiveTrend inside InTouch to completely automate graphing.
- **ActiveX Controls.** New ActiveX controls include ActiveTrend, which allows the full functionality or partial functionality of the Trend application to run within an ActiveX container, such as InTouch. Also, ActiveEvent lets you trigger events from any external source that supports COM-enabled scripting. A complete event history will be stored in the IndustrialSQL Server for external events.

InControl

Wonderware InControl is an NT-based real-time open architecture control system that allows you to design, create, test and run application programs for controlling your process – faster than ever before.

You can create your own automation solution in a variety of graphic-based and text-based languages. InControl supports direct interfaces to a variety of I/O devices, motors, sensors, and other factory equipment and supports both legacy interfaces as well as new open device interfaces.

InControl provides an integrated control solution that replaces proprietary control systems with open architecture NT-based control, providing a lower cost control architecture with integrated connectivity, powerful processing capability, and easy expandability.

Like all Wonderware products, InControl is tightly integrated with InTouch and the components of FactorySuite, providing unprecedented power and productivity to the industrial world.

Performance Features

Performance features are:

- **Open Architecture.** InControl can be used on any platform that supports the Microsoft Windows NT operating system, including flat panel industrial workstations, SMP servers and open industrial controllers.
- **NT-Based.** InControl is based on native Microsoft NT, taking full advantage of all the real-time and extensibility capabilities that NT provides. InControl supports distributed control via DCOM, with peer-to-peer communication built into the product.
- **I/O Support.** InControl supports popular I/O interfaces for Open Device Network Interfaces as well as legacy I/O systems: DeviceNet, Profibus, GE90/30, GE Genius, PCDIO, DDE, AB KXT, Interbus-S Gen III & IV, Opto22 PAMUX, and SuiteLink. This list of supported drivers is continually being expanded. A toolkit will available for creating custom drivers for use with InControl.
- **International Standards.** InControl is compliant with IEC 1131-3, OMAC and Open Device Network Interfaces.
- **Online Features.** InControl supports a variety of online monitoring and editing capabilities including Monitor Process status, Force I/O, Online Editing, Power Flow Highlighting, and Debugging.

New in FactorySuite 2000

InControl 7.0 expands your control capabilities with new technology and higher performance. You now have access to ActiveX Controls, DCOM connectivity, New Editors and added features that make InControl easier and more fun to use.

- **Extensible ActiveX Factory Object Support.** Create your own custom algorithms in C, Visual Basic or Java and call them from InControl as an ActiveX object.
- **Enhanced ST Text Editor.** New ST editor provides stand-alone scripting and enhances SFC editor capabilities as well.
- **New Factory Objects** make your application easier and more robust. The PID Factory Object provides you with a robust, full-featured PID capability, including loop simulation.
- **Improved Watch Window.** Added features to make it easier to debug and troubleshoot your application software.
- **Enhanced Runtime Engine.** Faster, more flexible, with more features.
- **Integrated Tag Browser.** One-time tag definition for FactorySuite, tag export/import.
- **Peer-to-peer connectivity.** Integrated SuiteLink client and server capability.

Scout

Wonderware Scout exploits FactorySuite's Intra/Internet capabilities to allow you to view factory information anywhere, anytime. Scout is a web server add-on and client browser that allows read-only remote viewing of FactorySuite data/visual objects and a variety of other data sources over the Inter/Intranet. Scout provides remote viewing capability using a three-tier architecture: thin client, server, data provider.

- **Client – Browser or Scout VT.** Visual objects can be viewed from the server using a standard browser with the appropriate URL. Scout VT extends a browser's capability by providing a set of user-configurable ActiveX objects such as graphs, charts, and trend elements that can be dynamically linked to FactorySuite data.
- **Server – Scout Outpost.** A set of web server components that run on Microsoft's Internet Information Server (IIS) and link existing FactorySuite applications to the Internet.
- **Data Provider.** FactorySuite components such as InTouch, InControl, and IndustrialSQL Server.

By taking advantage of the universal connectivity of the Internet through the three-tier architecture, Scout allows you to easily create, store, and change views of factory information to suit your specific needs.

Performance Features

Scout enables point-and-click browsing of remote factory information source(s) over the Internet/Intranet either using Scout VT or a standard browser. Scout can be used by management and production personnel to visualize factory data at their desktop or home office.

- **User Configurable Views.** Scout VT allows users to create views of factory information "on the fly" and store those views for recall at a later time. The views can also be stored on a web server allowing other users access.
- **FactorySuite Aware.** Scout is "smart" about FactorySuite data sources. This facilitates very fast search and configuration.
- **Extensible.** Both Scout VT and Scout Outpost can be extended to support user-defined visual objects and data types. This allows disparate factory information types to have a common look and feel for both browsing and configuration.
- **Connects To Multiple Web Sites.** Scout VT can retrieve real-time information from more than one data source simultaneously on the World Wide Web, and can also drill down into each web site for specific data elements.
- **Integrated ActiveX Browser**. Scout VT contains a fully encapsulated browsing ActiveX to facilitate browsing of Scout Outposts and any other web site.
- **Security.** Scout adds an additional single layer of security on top of that provided by the web server. Scout Outpost supports configuration and validation of passwords for access to data. The Scout Outpost will exchange data only with requesters that have passed the user password validity check.

New in FactorySuite 2000

The following features are new for FactorySuite 2000:

- **New Data Sources.** Including IndustrialSQL Server, SPC Pro, InBatch and InTrack.
- **Data Agents.** Included with the Scout Outpost are "data agents" that can access CSV files, ODBC data sources and IndustrialSQL Server.

InTrack

Wonderware InTrack provides a Windows NT-based, scalable, cost effective means to monitor, manage, track and improve production operations. InTrack allows manufacturers to model and track critical resources in a factory, including work orders, materials, product specifications, work instructions, equipment, people, and process/analytical data. InTrack enables users to implement client/server applications that help them to control and improve their manufacturing operations in a fraction of the cost and time of alternative approaches.

Performance Features

Performance features are:

- **Lowest total cost of ownership (TCO).** InTrack, along with FactorySuite, has proven to reduce the total cost of ownership associated with implementing real-time resource tracking systems by 20 to 100% versus competitive offerings and home-grown solutions. InTrack's powerful modeling environment and full-featured GUI and transaction engine reduce both the initial time and effort to implement the system and the cost associated with the inevitable change, enhancement, and maintenance of the application.
- **Comprehensive tracking functionality and manufacturing decision support.** InTrack provides a comprehensive real-time view and historical record of all the elements of production. InTrack provides an up-to-the-second view of WIP and shop floor inventory, order status, equipment utilization, and process performance. The InTrack database maintains a complete genealogy of the materials, equipment, people and critical data points for traceability, compliance or costing purposes. InTrack also provides a framework for delivering the right information to the right people at the right time, including dispatching information, work instructions, process specifications and standards, and production reports. A powerful report writer is included with InTrack that permits standard and custom reports to be printed, delivered via e-mail or published to Internet web content.
- **Integral component of FactorySuite.** InTrack integrates seamlessly with InTouch, IndustrialSQL Server, and SPC Pro to provide a comprehensive means for modeling, acquiring, and visualizing all elements of the manufacturing process and to enable automatic data transfer to and from plant floor devices such as PLCs, DCSs, and barcode readers.
- **Extensible and scalable system.** Through InTrack's open database and powerful ActiveX framework, it can be easily linked into other enterprise applications. This extensibility also permits the encapsulation of company/site/product-specific business rules within the InTrack application and custom application extensions to be developed in Microsoft's powerful Visual Basic®. These interfaces have allowed InTrack to be integrated with dozens of ERP and Advanced Planning/Scheduling systems , allowing FactorySuite to provide a key link in a successful supply chain management initiative.

New in FactorySuite 2000

The following features are new for FactorySuite 2000:

- A rich set of ActiveX controls for constructing high-performance, easy-to-use operator interface applications in record time.
- Our ActiveX transaction engine also includes a number of new functions, increased performance and provides enhanced integration capabilities. The transaction engine is an ActiveX server through which all InTrack runtime functions are performed.
- A comprehensive set of new transactions, capabilities and functions have been added to both the modeling and runtime components of InTrack in direct response to customer application needs.

InBatch

Wonderware InBatch is flexible batch management software designed to automate and provide a complete production history for batch processes. Consistent with the Instrument Society of America (ISA) S88.01 standard, InBatch allows you to quickly and easily create recipes and simulate their execution against a model of the process – all before writing one line of control code. InBatch also provides complete production history and materials genealogy. InBatch's powerful batch engine, combined with its integration with FactorySuite, means that you can reduce the cost and time to implement your batch-related processes by up to 40 to 60% over competitive solutions.

Performance Features

Performance features are:

- **Batch Management Capabilities.** "Out of the box" batch management functionality eliminates the need for unsustainable custom code in the PLC or DCS and dramatically reduces the life-cycle engineering effort. The sophisticated batch engine is responsible for Unit-to-Unit Material Tracking, Short Term Scheduling, Dynamic Batch and Equipment Management, and Batch History and Reporting. The batch management system also supports redundancy for mission-critical applications.
- **Recipe Management.** Recipes are graphically created in InBatch by selecting processing capabilities from the Process Model. Recipes are entered as Master Recipes (equipment and path independent) and are dynamically transformed into Control Recipes (equipment dependent) during runtime. The recipe management system contains many ease-of-use features that allow non-production personnel to quickly and easily build recipes.
- **Integration with FactorySuite.** InBatch provides ActiveX objects as well as a large number of pre-configured InTouch Wizards and script functions that allow rapid client application development. Process alarms and operator events are automatically stored with InBatch production history. InBatch can also leverage the powerful features of the InTrack, IndustrialSQL Server, and SPC modules included in FactorySuite.
- **Extensible and Open.** InBatch offers a rich set of ActiveX objects and API functions for integrating external applications such as ERP or scheduling systems and allowing exchange of formulas/recipes, materials and production results. InBatch also uses Microsoft SQL Server as its historical repository to provide open and easy access to all batch history data. These interfaces make it easy to integrate with ERP and Advanced Planning Systems, allowing InBatch to be a key link in a successful supply chain management initiative.

New in FactorySuite 2000

The following features are new for FactorySuite 2000:

- **New and Improved User Interface.** All InBatch applications with a graphical user interface (GUI) have been redesigned for an up-to-date Windows look and feel.
- **Enhanced Recipe Development Tools.** A recipe-independent library of operations is available for saving and retrieving recipe procedure components. In addition, the Recipe Editor includes toolbars for easy access to procedure functionality and supports the ability to drag-and-drop operation, phase and transition logic objects.
- **Introduction of Batch ActiveX Controls.** The batch management system supports ActiveX object technology for access to batch execution information and sequencing. There is an object that graphically depicts an executing batch. Another object provides access to batch scheduling and runtime execution. These objects provide a very easy interface for integrating InBatch with ERP and Finite Scheduling applications.
- **Standard Batch History Database.** InBatch historical data will reside in Microsoft SQL Server 6.5. SQL Server provides a standard, open database format that allows easy access to InBatch historical data from external applications. With SQL Server as the historical foundation, InBatch can be integrated with IndustrialSQL Server for generating reports containing both batch and continuous data as well as with external systems to report on material consumption/production.

FactorySuite Toolkit

The FactorySuite Toolkit is a powerful set of product-specific tools that allows you to extend FactorySuite 2000 to meet your specific application needs. The FactorySuite Toolkit contains the following five development kits.

Note The toolkits are available as separate products and are not included as part of the FactorySuite 2000 release.

- **InTouch Extensiblity Toolkit** contains:
  - The **Wizard Development Kit** for creating pre-configured graphical objects or command sequences
  - The **Script Development Kit** for creating complex algorithms and embedding them directly into the InTouch scripting language
  - The **IDEA (InTouch Database Extension APIs) Toolkit** lets users give external applications access to the InTouch database.
- **I/O Server Toolkit** allows the user to develop I/O Servers that use DDE, Wonderware's fast DDE, and SuiteLink protocols. Any DDE-aware Windows client can access data from the I/O server developed with the I/O Server Toolkit. A new version of FastDDE and SuiteLink allow creating I/O Servers with time stamping and quality information.
- **InControl I/O Toolkit** allows the user to develop I/O drivers to communicate to the InControl client.
- **InBatch Toolkit** enables the user to access the different InBatch databases. The user can also control certain InBatch processes.
- **Scout Toolkit** enables the user to develop data agents to their database. The Scout client can then access the information through the data agents.

S/Is, Third-Party Developers, OEMs, VARs

Wonderware has a series of innovative programs for systems integrators, developers of third party products, original equipment manufacturers and value added resellers. Our Partners add productivity enhancement components such as vertical market wizards, ActiveX objects, symbols, and I/O Servers to expand FactorySuite's functionality in new markets. In addition, our strong relationships with systems integrators bring expertise to our distribution channel, OEM suppliers that can build Wonderware software into their equipment, and value added resellers sell bundled products into new markets.

Partners are a vitally important part of Wonderware's future growth plans. Today, we have more than 600 Systems Integrators worldwide that work with Wonderware, and almost 300 third party product developers. Among the program benefits are specialized product training and a web-based resource center for systems integrators; complementary listings of third party developer products on the Wonderware web site and on the WonderTools CD-ROM that is shipped with every copy of FactorySuite 2000; and the opportunity for partners to participate at major Wonderware trade shows and developer conferences.

CHAPTER 2

Hardware and Software Requirements

This chapter describes the hardware and software requirements for all components of the FactorySuite. Make sure that all of the hardware and software requirements are met before installing any component of the FactorySuite. Both the minimum requirements and the suggested requirements are included.

Contents

General Server Considerations

General server requirements apply to any FactorySuite component that will function primarily as a data server to one or more client applications running on the network. Client requirements apply to components that access any type of server application for data or for processing power. Some Wonderware applications, such as InBatch, have both client and server components.

Machines that are sold as "servers" cost more than desktops; however, they have been designed for high-speed I/O performance. You should spend the extra money and buy a machine designed for this purpose. When selecting a server, you should look for the following features:

- Intelligent, fast SCSI-2 disk controller or disk array controller
- Controller memory cache
- Bus Master card – the on-board processor results in fewer interrupts to the system CPU(s)
- Asynchronous read and write support
- 32-bit EISA or MCA bus
- Hardware-level RAID support
- Fast SCSI-2 drives. Newer SCSI drives are "Fast-Wide" with twice the data transfer rate.
- Read-ahead caching (at least one track)
- Multi-processor. Both Microsoft SQL Server and Windows NT are designed to automatically take advantage of multi-processing. Windows NT automatically uses multiple processors to run multi-threaded applications.

Important! Make sure that all of the hardware (the CD drive, SCSI controller, memory, processor, hard-drives, and so on) is on the NT compatibility list.

UPS

The server should be attached to a UPS (Uninterrupted Power Supply). The Windows NT operating system can be attached to a 'smart" UPS and perform an orderly shutdown in the event of a power failure. This may be important if you are writing a lot of data to the SQL database (aggregates, and so on). It can take Microsoft SQL server a long time to rebuild the SQL databases if Windows NT does not perform an orderly shutdown.

Drive Types

There are two main drive types to consider, IDE drives and SCSI drives. There are different types of IDE and SCSI drives, such as: SCSI, Fast-SCSI, and Fast-Wide-SCSI. Different drives within a certain type of drive also have different speeds which should also be considered. Drives with 15ms access times are better than drives with 20ms access times regardless of the type.

Remember that most system bottlenecks occur at the drive level.

1. Multiple drives reduces access time to data as opposed to using very large drives (that is, 4 x 1 GB disks will provide faster access to data than 1 x 4 GB disk.)
2. Using multiple disk controllers is faster than having a single disk controller.
3. It is a good idea to have the system on one controller and the data on a separate controller.
4. Generally speaking, the more disks and the more controllers the better!

The Microsoft Windows NT operating system requires special configuration if it is to utilize more than two non-SCSI drives. You will be utilizing at least two disks and any type of RAID protection will likely require more. IDE drives are typically slower than SCSI (about 25% of the SCSI speed).

The Microsoft Windows NT operating system supports 7 SCSI drives and two non-IDE drives out of the box so this may be the way to go.

SCSI drives take better advantage of Windows NT Servers mirroring and stripe set features, (related to SCSI's sector sparing) and are extremely fast.

Disk Controllers

You want to have a fast disk and/or controller. Check what the controller card is capable of 8-bit, 16-bit, or 32-bit transfers - the more bits in the transfer, the faster the controller moves data.

Use a fast driver technology - IDE (Integrated Drive Electronic) has 2.5MB/s throughput, ESDI has a 3 MB/sec, SCSI-2 which has 5MB/s, Fast SCSI-2 has 10 MB/s, or Fast Wide SCSI-2 has 20 MB/s.

Disk Formatting

When managing disk drives, you can create "virtual" drives, or sets, from the actual physical disks. There are two types of sets that you can create, as described in the following table.

Type	Description
Volume Set	Combines free space on a drive or a number of drives to form a single volume, which appears to the operating system as a single, large drive. By creating volume sets, you can utilize otherwise wasted space. Also, volume sets can improve disk I/O performance because data is more often read and written to several drives instead of just one. Volume sets can only be used in Windows NT.
Stripe Set	Similar to a volume, but data is broken up and divided across a number of drives, almost simultaneously, rather than filling the volume from the bottom up. In stripe sets, all of the partitions must be the same size; therefore, the smallest free space determines the common size for all the portions of the stripe set.

NTFS and FAT

There are two types of file systems to consider: NTFS and FAT. NTFS is the preferred system since it provides better file protection, and is faster. It also supports disk compression. NTFS is the preferred file system to use on volumes greater than 400 MB because disk performance does not degrade with larger volume sizes. With the FAT file structure, the disk space taken by files is more than with NTFS because the FAT system uses clusters to allocate disk space for files. A cluster is the smallest allocation unit that FAT will use. For a 1-byte file, FAT allocates a complete cluster.

The actual size of a cluster depends on the size of the volume. For a 4 GB volume, the cluster size would be 64 KB which is the theoretical limit for a FAT volume since the FAT Allocation Table allows 64 KB entries.

RAID

RAID refers to a *Redundant Array of Inexpensive Disks*. There are a number of different types of RAID and a number of methods of implementation. The purpose of using a RAID is to protect against a disk failure. Which types of a RAID you choose to implement determine what the cost and effect of a failure are.

There are two methods of implementing a RAID: software and hardware.

Software RAID

Microsoft's NT Server includes different types of a RAID as part of the operating system. They are often referred to as NT Software RAID. The big advantage to this method of implementing a RAID is that it is cheap. The only cost is the additional disks that are required. You are also not locking yourself into a particular vendor's solution.

Hardware RAID

Numerous hardware venders sell disk arrays that use the different forms of a RAID. This is generally a better solution than using a software RAID because there is no overhead added to the operating system. The biggest disadvantage to a hardware RAID is that disk arrays are usually expensive.

RAID Level	Description
RAID 0	Known as disk "striping." Information is spread across several disk drives (at least three) instead of just one. RAID 0 also results in improved performance since the data is stored across multiple disks.
RAID 1	Allows a copy of a disk to be created, called a "mirror." The system performs two write operations (one to each disk) each time it has to write to a disk. It is the most expensive to implement since the amount of disk space is doubled. All partitions that are mirrored must be the same size. For true redundancy, the two disks should be on different controllers.
RAID 5	RAID 5 permits applications to keep running even if one of the hard disks fails. RAID 5 has the addition of parity checking, which facilitates data recovery.

Hot Swappable Disks

Hot swappable disks require special hardware. It is expensive but may be worth it if you want to replace a failed disk (mirror or stripe set) without having to shutdown. Top of the line disk arrays will include 'spare disks' built in which are standing by and ready to take over in the event of a disk failure.

InTouch

Note Beginning with Wonderware FactorySuite InTouch Version 7.0, InTouch no longer supports the Microsoft Windows 3.x or Microsoft Windows for Workgroups operating systems.

The following table describes the minimum and suggested hardware and software requirements for InTouch:

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 100 MHz processor.	--
Minimum Memory	32 MB of RAM.	We recommend 8 MB of RAM per 5,000 tags. For example, 48 MB of additional RAM for 32,000 tags and 128 MB of RAM for 60,000 tags.
Free disk space	At least 100 MB.	--
Operating System[1]	Microsoft Windows NT Workstation: Version 4.0, Service Pack 3. **OR** Microsoft Windows 95, Service Pack 1.	--
Network protocol	Any protocol currently supported by Microsoft Windows NT or Windows 95. TCP/IP required if SuiteLink is used.	--
Display	VGA color display capability.	Super VGA with 256 colors and 800 x 600 pixel resolution or higher.
Selection device	Pointing device. For example, mouse, trackball, touch screen.	--

Notes:

[1] For the Windows 95 operating system to implement the distributed functionality of InTouch, Wonderware NetDDE must be installed and operational.

InControl

The following table describes the minimum and suggested hardware and software requirements for InControl:

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 150 MHz or higher processor.	--
Minimum Memory	32 MB of RAM.	64 MB to 128 MB of RAM for large projects (over 32,000 symbols).
Free disk space	50 MB	100 MB
Operating System	Microsoft Windows NT Workstation: Version 4.0, Service Pack 3.	--
Network protocol[1]	Any protocol currently supported by Microsoft Windows NT. TCP/IP required if SuiteLink or DDE is used.	--
Display	VGA color display capability.	Super VGA with 256 colors and 640 x 480 pixel resolution.
Selection device	Mouse or other pointing device compatible with Microsoft Windows NT operating system.	--

Notes:

[1] The SuiteLink toolkit is used for both client and server DDE and SuiteLink communications and will not run without TCP/IP. DCOM communications will run using any network protocol supported by Windows NT.

Additional Considerations

In general, development of InControl projects can be done on any client or server PC, but for production nodes where consistent timing is important, hardware must be selected and tested carefully. For single processor machines, video display, disk drive controller, and network cards must be evaluated for their impact on real-time performance. Animation and smooth scrolling should be disabled in the video driver, and it is recommended that you use a single disk drive controller. A large amount of network traffic can also have an impact on real-time performance. Multiple processor (SMP) machines do not have the same limitation, and are recommended if fast scan times are required, or where consistent real-time performance is critical.

IndustrialSQL Server

In order for your IndustrialSQL Server and client applications to achieve maximum performance, be sure that all of the hardware and software requirements are met. Since IndustrialSQL Server is a high-performance relational database, it is also important to size your system to handle the level of input that you will anticipate storing.

The IndustrialSQL Server is a fully integrated Windows NT BackOffice application. IndustrialSQL Server offers a scaled-server environment to suit individual processing needs and supports Microsoft Windows NT hardware platforms from entry-level single processor, through multiprocessor servers using the Intel x86 range of processors, to Pentium processors. IndustrialSQL Server is specifically designed as a multithreaded server application and takes advantage of symmetrical multiprocessing (SMP) architectures.

Server Requirements

The following table describes the minimum and suggested hardware and software requirements for running the IndustrialSQL Server. It is highly recommended that you run the IndustrialSQL Server on a dedicated machine.

- Do not use it as a domain controller, mail server, and so on.
- Do not use the machine as a workstation.
- Do not use the machine for InTouch, InControl, and so on.

If you choose to install a "small" IndustrialSQL Server (500 tags or less), the required minimums are sufficient. The performance of the client applications is dependent on the number of concurrent connections.

Hardware or Software	Required Minimum	Suggested
CPU[1]	Intel Pentium processor.	Pentium 166 MHz or higher processor.
Minimum Memory[2]	32 MB of RAM.	At least 64 MB of RAM.
Free disk space[3]	500 MB.	At least 2 GB.
Operating System[4]	Microsoft Windows NT Server: Version 4.0, Service Pack 3.	--
Other Software[5]	Microsoft SQL Server: Version 6.5, Service Pack 3.	--

Network protocol[6]	Any protocol currently supported by Microsoft SQL Server 6.5. TCP/IP required if SuiteLink is used.	--
Display	640 x 480.	--
Selection device	--	Mouse recommended.

Notes:

[1] Increase processor power for high data rates or complex query usage.

[2] 32 MB is adequate for a system having 1000 tags. Add 5MB for each additional 1000 tags. Also add 2 MB for each concurrent user expected to connect to the server.

[3]SCSI drives configured using hardware RAID is optimum. The disk space required is a function of data rate and the desired history duration. NTFS is highly recommended for increased data reliability, compression, and performance. See your Microsoft documentation for more information on NTFS.

[4]Service Packs can be downloaded from the Microsoft web site.

[5]Microsoft SQL Server, including Service Pack 3, can be installed using the IndustrialSQL Server installation program.

[6]You can use the default Microsoft SQL Server 6.5 protocol (named pipes) with TCP/IP.

Client Requirements

The following table describes the minimum and suggested hardware and software requirements for installing all of the Wonderware IndustrialSQL clients:

Hardware or Software	Required Minimum	Suggested
CPU	IBM-compatible, 80486 processor.	Pentium 100 MHz or higher processor
Operating System	Microsoft Windows NT Workstation: Version 4.0, Service Pack 3.	--
	OR	
	Microsoft Windows 95, Service Pack 1.	
Minimum Memory	If running on the Windows NT operating system, 16 MB of RAM.	If running on the Windows NT operating system, at least 32 MB of RAM.
	If running on the Windows 95 operating system, 12 MB of RAM.	If running on the Windows 95 operating system, at least 16 MB of RAM.
Free disk space[1]	20 MB to install all client applications.	At least 50 MB to install all client applications.
Network protocol	Any protocol currently supported by Microsoft SQL Server 6.5.	--
Display[2]	800 x 600.	1024 x 786.
Selection device	Mouse or other pointing device.	--

Notes:

1 Includes 5 MB of online books.

2 Trend requires a minimum of 800 x 600. VectorMaster, VectorViewer, QuickLook, Control, and Configure can run on 640 x 480.

System Sizing

System sizing is a complex process. When determining the size of your system, be sure that you allow for:

- Sufficient bandwidth for reliable data storage. This includes a combination of I/O, disk subsystem, and processor power bandwidth.
- Spare bandwidth and memory for client connections and query servicing.
- Adequate storage space for the required history period.

One of the major factors in how well the IndustrialSQL Server will perform is how the network architecture is set up. In general, the faster the hardware and software and network connections, the better the performance. Major architectural factors affecting the performance of the system are:

- Platform choice.
- Processor configuration: single or Symmetric Multi-Processor (SMP).
- Computer configuration: the number of computers in a distributed (multi-mode) IndustrialSQL Server configuration.
- Disk sub-system performance.
- Network bandwidth.

Another major factor in system performance is the amount of plant data you anticipate storing in the system, including considerations about how often that data will be stored and retrieved. In general, the more you store, the more often you store it, and the more you retrieve it, the slower the system. Major storage factors affecting the performance of the system are:

- Effective analog flow rate (analog updates per second).
- Period of online data storage required.
- Effective binary variable flow rate.
- Number of concurrent end users required.
- Complexity of end user queries.

The rate at which the IndustrialSQL Server can acquire and store data reliably is not directly related to how quickly the data can be returned to clients. A "slower" system does not mean that it cannot acquire and store vast amounts of data.

IndustrialSQL Server Hardware

Hardware selection is one of those fuzzy areas where there is likely no ‘correct’ answer however there are a lot of ‘incorrect’ ones. There are a number of questions that need to be answered before a server can be chosen for your organization. They include:

1. How important is the data? Is it acceptable that four weeks of data is stored online and is then over-written?
2. How important is the configuration, event and summary data? (This is the information that is stored in the Microsoft SQL Server database.)
3. How often is data on the Microsoft SQL Server database changing?
4. How long can the system be off-line in the event of a component failure?
5. Is anyone in the organization going to require operating data that is older than a month? Older than a year?
6. How much is the SQL Server component of IndustrialSQL Server expected to be used (that is, the summary and event sub-systems)?
7. What happens if the system stops storing data?
8. What happens if stored data is lost as a result of a hard drive failure?
9. Can the server equipment be taken off-line to perform repairs?

Memory Requirements

For a complete IndustrialSQL Server system, the following components put a demand on memory.

1. IndustrialSQL Server systems, which includes I/O Servers, data acquisition, and data storage.
2. Microsoft SQL Server
3. Windows NT Server
4. Client Access (Data Retrieval), which includes caching.

When determining the amount of memory to purchase, remember that it is likely the cheapest (and easiest) thing that you can do to improve performance. The difference in performance is noticed by the end-users running client applications who are ultimately your customer for the IndustrialSQL Server data.

- More memory will reduce the amount the server has to use virtual memory - lowering the load on the disk subsystem.
- Processes needed by the server will become faster because they are memory-resident.
- Even if you have lots of memory (performance monitor indicates that Pages/sec counter is NOT high), additional memory will be used as additional disk cache, speeding up disk access and therefore file service.

The following table provides the guidelines for memory requirements:

For every	You will need
1000 tags (initial)	32 MB Windows NT requires 16 MB and Microsoft SQL Server requires 16 MB.
1000 tags (additional)	5 MB
Concurrent user	2 MB

For example, a 5,000 tag system with 5 concurrent users would require 62 MB of RAM. The calculation is as follows:

Minimum (which includes the first 1000 Tags)	**32 MB**
5000 tags - 1000 tags = 4000 tags x 5 MB (per 1000)	**20 MB**
5 concurrent users x 2 MB (per user)	**10 MB**
Total	**62 MB**

Disk Configuration

The disk configuration is likely the most important aspect of the long term reliability of IndustrialSQL Server. The design of IndustrialSQL Server requires extensive disk activity. The long term maintenance of the IndustrialSQL Server application is also an important consideration when selecting a disk system. This includes issues such as redundancy, RAID, backups, and so on.

IndustrialSQL Server has three types of data to protect:

1. SQL Database - this stores all of the configuration information etc. and represents your investment in engineering. This is extremely important to backup. It also includes the summary and event data which may represent several years of operation.
2. Dynamic Data - this is the full resolution data - its importance depends on your particular plant and what is being logged.
3. Machine Configuration - this is installed s/w for NT Server, SQL Server, etc.. To loose this will infer time to get the system up and running.

The correct disk configuration depends on how important the data is and how long you can afford to take to recover from a failure. **Regardless of the disk configuration selected, regular backups of your data should be made, in particular the SQL databases.**

In a typical IndustrialSQL Server, there will be a minimum of two physical disks - a System disk and a Data disk. The **System** disk would contain the operating system, SQL Server, IndustrialSQL Server, and the Paging file. The **Data** disk would be used for the storage of the dynamic data (history blocks).

Space for Historical Data Storage

IndustrialSQL Server stores historical data in a file structure directly on the disk - as opposed to data which is stored within the SQL database. (Historical data is all of the high resolution data stored from the PLCs, and so on, and will contain analog and discrete values.) The amount of data created is dependent on the number of tags being stored, such as the storage rate. The following table provides a rough estimate:

Hardware Platform	**Analog Tags** Avg. storage rate = 1 min.	**Discrete Tags** Avg. storage rate = 1 min.	**Storage** GBytes per month
Pentium 100 32 MB of RAM	1,000	1,000	1
Pentium Pro 150 80 MB of RAM	4,000	4,000	4
Dual Pentium Pro 166 128 MB of RAM	12,000	12,000	12
Quad Pentium Pro 200 256 MB of RAM	20,000	20,000	20

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

The hard disk(s) should be configured so that there is a directory available for historical data storage. This directory will be used to store real-time plant data. When the free space on the drive containing this directory drops below a minimum threshold, the oldest data will be overwritten. The amount of time covered by the historical data depends on the size of this drive.

To determine the minimum threshold (in megabytes), the system reads the value set in the *MinAltBytes* Registry key. This Registry setting determines the size and the minimum threshold for both the circular and alternate storage areas. This value can be found in the following hive:

HKEY_LOCAL_MACHINE\Software\Wonderware\InSQL\Storage

Important! You must have sufficient disk space in the circular storage area to hold at least two history blocks, plus the space specified for the minimum threshold.

Additional directories may be set aside for the restoration of old backups, or for data kept for special purposes.

📖 For more information see your *IndustrialSQL Server Administrator's Guide*.

Space for Configuration Data Storage

The different MS-SQL databases which store the configuration data require very little space. These databases include the *Runtime* and *Holding* databases. They are typically 20MB in space each which is lots of room. The system however may be configured to store additional data to the MS-SQL database. This may be custom information that is entered via various client applications, event data, or summary data.

IndustrialSQL Server allows summary data to be stored for each of the analog values in the SQL database. For example, an analog tag such as 'level' can be configured to store the maximum, minimum, and average over a certain time period. This information is stored in the SQL database and is not part of the dynamic data which is stored in data files.

The amount of aggregate storage will determine the loading on the SQL server database since the configuration data is generally static. The aggregate storage increases the size of the database (because the tables are filling) and also creates entries in the log file.

Windows NT File Compression

You should enable file compression for the historical data storage locations - Circular, Buffer, and Permanent. File compression on these directories is automatically set during the installation process.

Note File compression is only available for the NTFS file system.

InBatch

InBatch is comprised of the following components:

- InBatch Server
- InBatch Development Client
- InBatch Runtime Client

This section outlines the hardware and software requirements for each.

InBatch Server Requirements

The following table describes the minimum and suggested hardware and software requirements for the InBatch Server.

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 90 MHz processor.	Pentium 200 MHz or higher processor.
Minimum Memory	32 MB of RAM.	64 MB of RAM.
Free disk space	40 MB.	100 MB (Allowing for configuration databases).
Operating System	Microsoft Windows NT Server: Version 4.0, Service Pack 3.	--
Network protocol	Any protocol currently supported by Microsoft Windows NT. TCP/IP is required if SuiteLink is used.	--
Other Hardware	ASCII/PostScript switching printer.	--
Display	1024 x 768. 2 MB Video RAM.	--
Selection device	Mouse or other pointing device.	--

InBatch Development Client Requirements

The following table describes the minimum and suggested hardware and software requirements for the InBatch Development Client.

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 90 MHz processor.	Pentium 200 MHz or higher processor.
Minimum Memory	32 MB of RAM.	--
Free disk space	20 MB.	--
Operating System	Microsoft Windows NT Workstation: Version 4.0, Service Pack 3.	--
Network protocol	Any protocol currently supported by Microsoft Windows NT. TCP/IP is required if SuiteLink is used.	--
Display	1024 x 768. 2 MB of Video RAM	--
Selection device	Mouse or other pointing device.	--

InBatch Runtime Client Requirements

The requirements for the InBatch Runtime Client is the same as for InTouch.

For more information, see "InTouch" earlier in this chapter.

InTrack

InTrack operates in a client/server environment. It is configured with a relational database management system (RDBMS) to store InTrack data. The installation requirements depend on which RDBMS is used with InTrack. InTrack supports two RDBMS products: Oracle 7.3™ and Microsoft SQL Server 6.5.

Server Requirements

The requirements for a server for InTrack vary based on application requirements and selected database server. Refer to the database application vendor's performance sizing documents for specific hardware requirements.

Size requirements for InTrack databases are:

- Oracle 7.3 - **minimum** initial size is 50 MB for data files, and two redo log files of 150 kilobytes (KB) each.
- Microsoft SQL Server 6.5 - **minimum** initial size is 20 MB for data files and 20 MB for log files.

Note When configuring an Oracle database, use the InTrack Table Configuration tool (TABLECFG.EXE) to specify table storage parameters. This file can be found in the \INTRACK\BIN\ subdirectory of the installed InTrack program files.

When configuring a SQL Server database, use two separate devices, one for storing data files and the other for storing log files. Purge the log files periodically to maximize disk space. See the SQL Server documentation for more information.

Client Requirements

The following table describes the minimum and suggested hardware and software requirements for running InTrack:

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 133 MHz or higher processor.	Pentium 200 MHz. Pentium Pro or higher processor.
Minimum Memory	Without InTouch development installed, 32 MB of RAM.	64 MB of RAM.
	With InTouch development installed, 32 MB of RAM.	
Free disk space	70 MB. (The InTrack application uses approximately 50 MB. The Crystal Reports component uses approximately 18 MB)	--
Operating System	Microsoft Windows NT Workstation: Version 4.0, Service Pack 3.	--
Network protocol	Any protocol currently supported by Microsoft Windows NT.	--
	TCP/IP is required if SuiteLink is used.	
Other Software	Client software (provided by your database vendor) installed.	--
Other Hardware	Network interface card.	Network interface card (high-performance PCI or bus card).
Display	640 x 480. (800 x 600 minimum for workstations running InTrack ModelMaker)	1024 x 768.
Selection device	Pointing device (for example, mouse, trackball).	--

Notes:

[1] Microsoft Windows for Workgroups™ and Windows 95™ are not supported.

Scout

Scout consists of two components: the Scout Outpost and Scout VT.

Scout Outpost

The following table describes the minimum and suggested hardware and software requirements for Scout Outpost:

Hardware or Software	Required Minimum	Suggested
CPU	Pentium 90 MHz or higher processor.	--
Minimum Memory	At least 32 MB of RAM.	--
Free disk space	At least 5 MB for the application files.	--
Operating System	Microsoft Windows NT: Version 4.0, Service Pack 3.	--
Network protocol	Any protocol currently supported by Microsoft Windows NT.	--
	TCP/IP is required if SuiteLink is used.	
Other Software	Microsoft Internet Explorer™ 3.01 or greater.	--
Other Hardware[1]	Minimum 14,400 BPS modem or a LAN network.	--
	Properly configured web server.	--
Display	VGA, 640 x 480	SVGA, 800 x 600.
Selection device	Mouse recommended.	--

Notes:

[1] Scout depends on standard HTTP and CGI techniques and works with any standard CGI 1.0 compliant web server. Scout Outpost has been tested using the Microsoft Internet Information Server®, the Netscape Enterprise Server®, and the Netscape Communications Server®. For more information, see the *Scout Online Guide* available on the internet.

Scout VT

The requirements for Scout VT is the same as for Scout Outpost, except that Scout VT can use either the Windows NT 4.0 or Windows 95 operating system.

I/O Servers

The hardware and software requirements are very specific for every server. Please refer to the data sheet for the I/O Server that you want to install.

SuiteLink

In order use SuiteLink for data communications for a computer, you must have the following installed on that computer:

- TCP/IP installed and configured.
- Windows NT operating system; Version 4.0, Service Pack 3.

Note You can run TCP/IP even without a network card installed in the computer. In Control Panel, choose the "loop-back" option in place of a network card, and then choose TCP/IP for your network protocol. For more information, see your Microsoft documentation.

CHAPTER 3

Installation

This chapter provides detailed instructions for how to install components of the FactorySuite. It is assumed that you have already established your plan for implementing one or more components of the FactorySuite, including what hardware and software you will use, how the network will be configured, and what options you want to install.

For information on networking options for each component, see Chapter 4, "Component Networking Options." For information on common components that are installed, see Chapter 6, "FactorySuite Common Components."

Contents

Running the Master Install Program

All products in the FactorySuite are installed beginning with a "master" install program, which contains installation options that are common to all products, such as the license agreement and product registration. When you select a FactorySuite product at the end of the master install, that product's installation program will automatically start up.

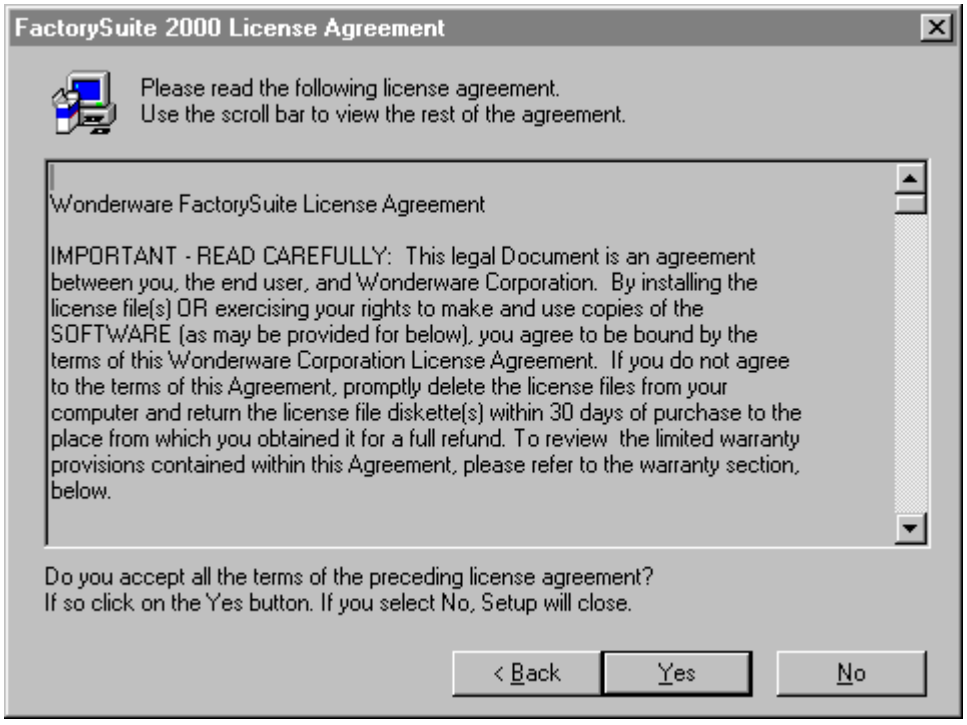
The master install program is on each CD and will automatically start up when the FactorySuite CD is inserted into your CD-ROM drive.

Note Some of the components of the FactorySuite require that Service Pack 3 for the Windows NT operating system is installed. If you do not have Service Pack 3 installed, the master install program will present a warning message.

➢ **To continue with the master install program:**

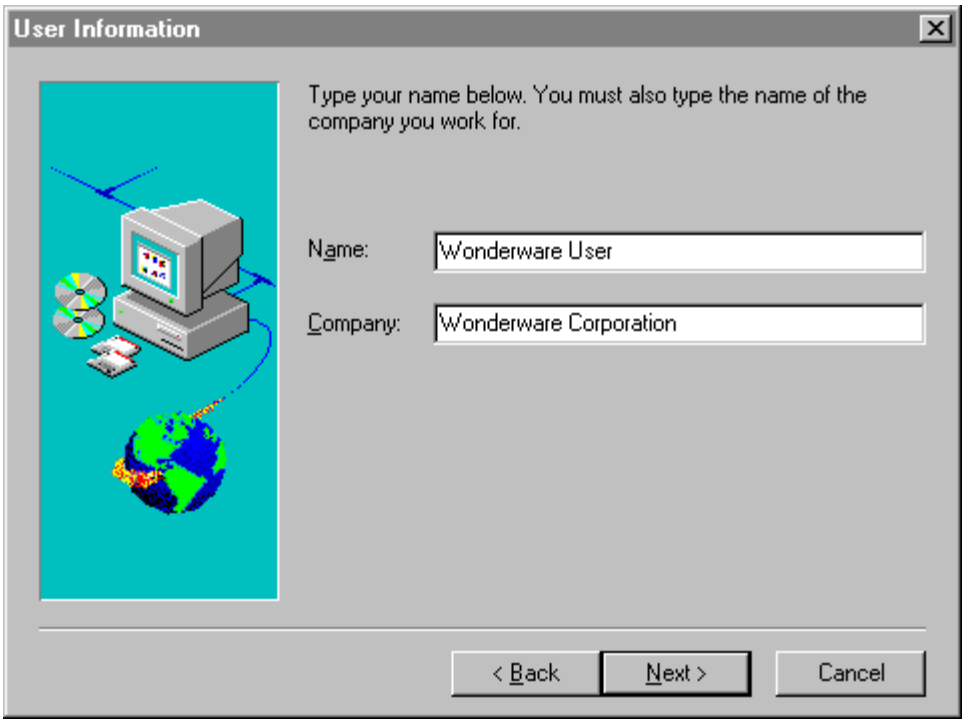
1. After reading the contents of the **Welcome** dialog box, click **Next** to continue with the installation.

   The **FactorySuite 2000 License Agreement** dialog box appears.

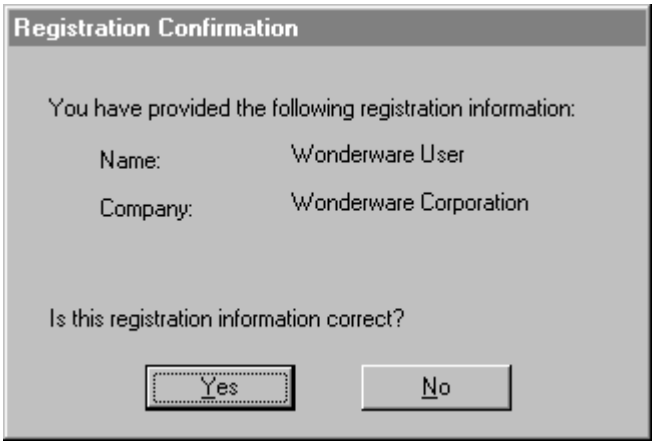


2. If you accept all terms of the license agreement, click **Yes**.

   The **User Information** dialog box appears.



3. Enter the appropriate registration information. You will be prompted to confirm the information that you enter.



4. Click **Yes** to confirm or **No** to go back and change the registration information.

   If you choose **Yes**, the **FS2000 Products** screen appears.

5. Click the name of the FactorySuite product that you want to install.

   Some of the products are composed of more than one component, in which case a screen will appear allowing you to choose which component you want to install. For example, either **IndustrialSQL Server** or **IndustrialSQL Client Tools**.

6. You will be prompted to enter the path to the installation files. If the selected product is not on the current CD, insert the appropriate CD, and then click **OK**.

7. The installation program for the individual FactorySuite product you selected will be automatically launched.

8. To complete the installation, go to the section in this chapter that describes installation of the FactorySuite product you selected.

Note If you exit an installation program for a FactorySuite component, this screen will reappear, allowing you to select a different component to install. This does not always apply to I/O Servers.

Common Installation Options

Some of the same installation options must be configured for multiple components in the FactorySuite. This section describes those common installation options.

FS2000 Common Components

Each of the FactorySuite components uses a set of common files. These common files are used for networking, error logging, functionality that spans components, and so on. By default, all common files are installed in a Common folder in the FactorySuite directory, where they can be shared by multiple components.

During the installation, you may be prompted to configure two of these common components: service information and Adobe Acrobat installation information.

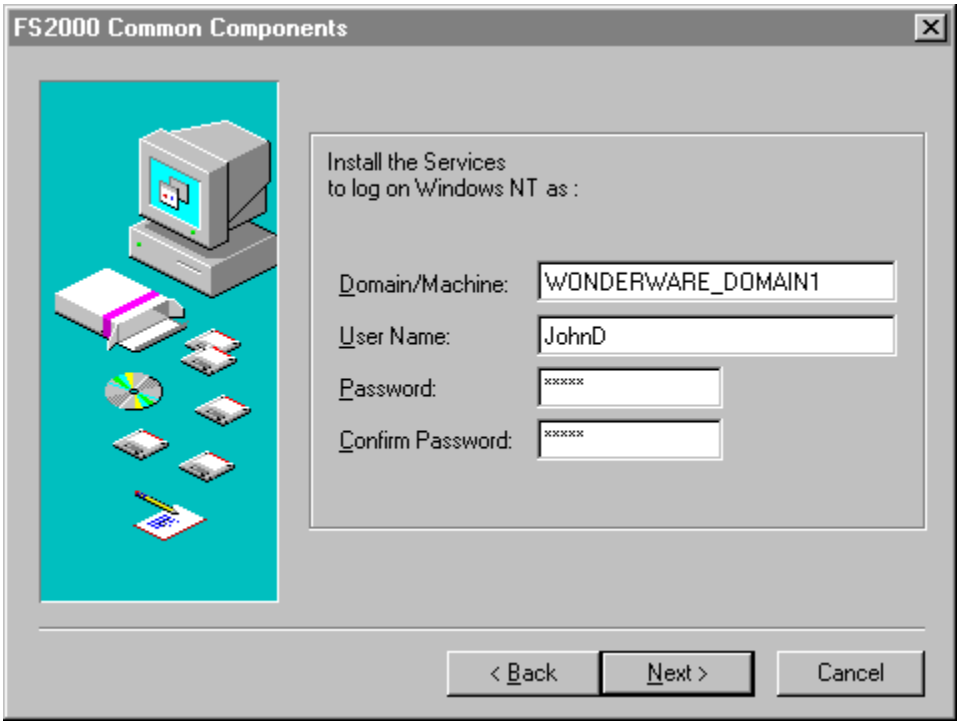
For information on common components, see Chapter 6, "FactorySuite Common Components."

Windows NT Service Information

A service is a process in Windows NT that performs a specific system function. Services can be configured to automatically start up when the computer on which the component is install starts up. All services run in the "background;" no visible signs of them running appear on the desktop. This eliminates the need for a user to log on to the computer and start the application. Also, a service continues to run as different users log on and off of the computer.

For more information on services, see Chapter 4, "Component Networking Options."

If the FactorySuite component that you are installing has processes that run as services, the **FS2000 Common Components** dialog box will appear:



Enter logon parameters for the user account that will have the rights for starting and stopping all FactorySuite components. When a FactorySuite component starts up as a service, this is the account information that will be used. This account must have administrative rights on the machine.

Domain/Machine
Name of the domain in which the user account will be validated. If you are not using a domain configuration, enter the machine name.

User Name
User name for the logon account.

Password
Password for the logon account.

Confirm Password
(same as password)

☞ To change the FactorySuite user account after installation, user the Wonderware Service User program. For more information, see Chapter 10, "Security."

Note If the user account information has already been entered and is still valid, the install program will not prompt you to re-enter this information.

Adobe Acrobat and Online Documentation

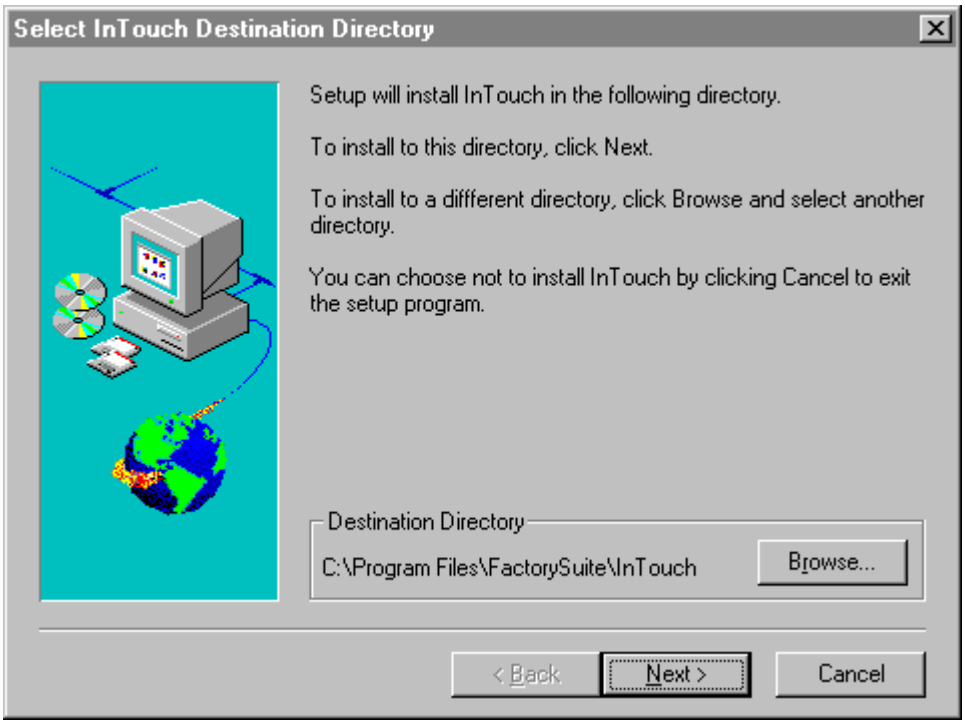
All of the FactorySuite documentation is shipped as Adobe Acrobat online documentation files (.PDF). If you do not have the Adobe Acrobat Reader installed, the installation program will launch the Reader installation as part of installing common components, regardless of whether or not you choose to install the online documentation.

If you choose not to install the online documentation to your hard disk, you may be prompted to create short-cuts to the online documentation files on the FactorySuite CD. The installation program will create an icon for each book that points to the directory on the FactorySuite CD that contains the book.

For more information on using the online manuals, see Appendix A, "For More Information."

Destination Directory

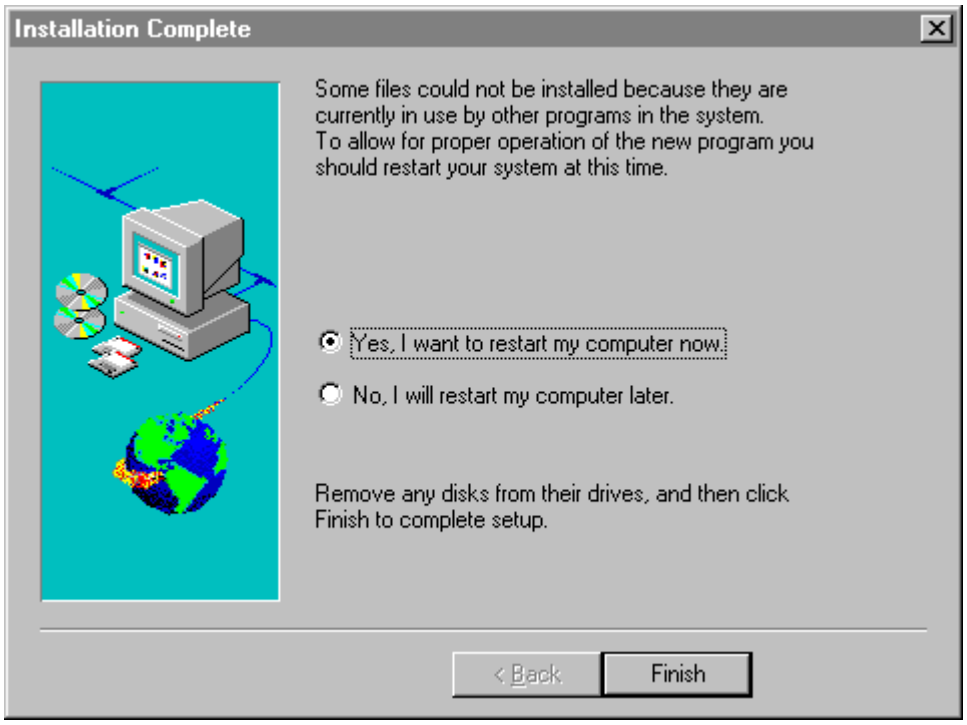
Each of the FactorySuite component installations will prompt you for an destination directory. This is the directory in which all component-specific files will be copied and, by default, is separate from the directory that contains the common component files. During the installation, a dialog box similar to the following will appear:



Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

Installation Complete

For each FactorySuite component, you will be prompted to acknowledge that the installation has been completed. Some FactorySuite components require a system restart in order for the installation changes to go into effect. In this case, you will be prompted to restart the computer:



Installing InTouch

During the InTouch installation, you can choose to install the following products:

- InTouch development system, which includes all of the tools for creating and running an HMI application.
- InTouch runtime system, which is the program used by the plant floor operator to interact with the HMI application in real-time.
- FactoryFocus, which is a view-only version of InTouch runtime.

Installation

➢ **To install InTouch:**

1. If you are installing InTouch from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install InTouch, return to this section and continue with Step 2 to complete the installation.

   If you are installing InTouch using the setup program on the InTouch CD, double-click SETUP.EXE in the InTouch folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

2. The **FS2000 Common Components** dialog box appears.
3. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the InTouch system.

   For more information, see "Common Installation Options."

4. Click **Next**.

   All required common component files will be copied to hard disk and your system will be configured. If you do not have the correct version of Adobe Acrobat currently installed on your computer, you will be prompted to install it.

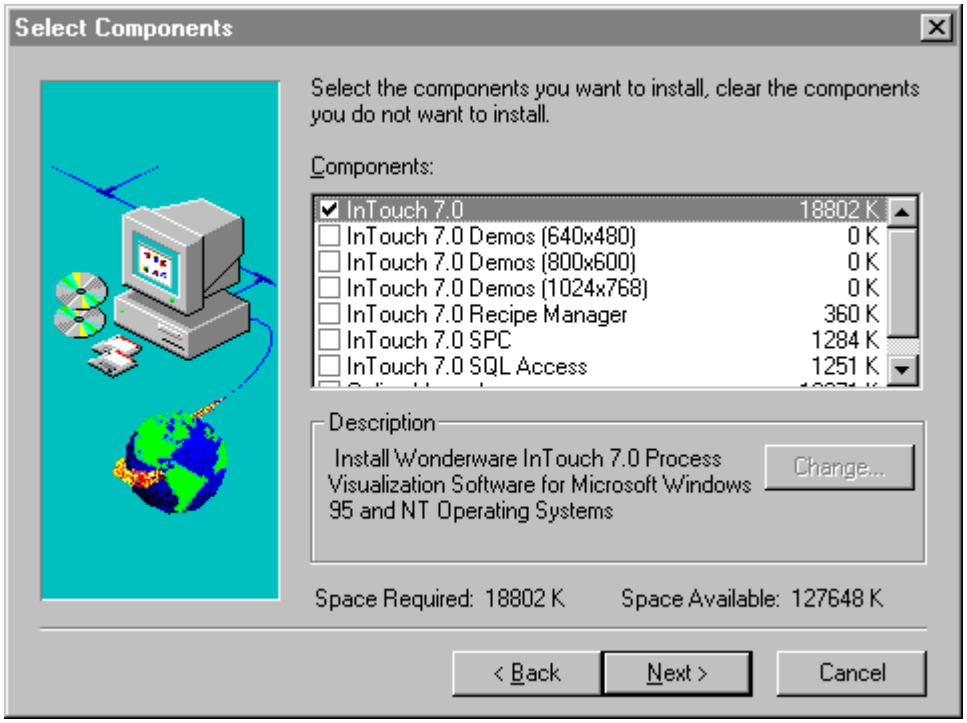
   For more information, see "Common Installation Options."

5. If InTouch is not currently installed, the **Select InTouch Destination Directory** dialog box appears.

   For more information, see "Common Installation Options."

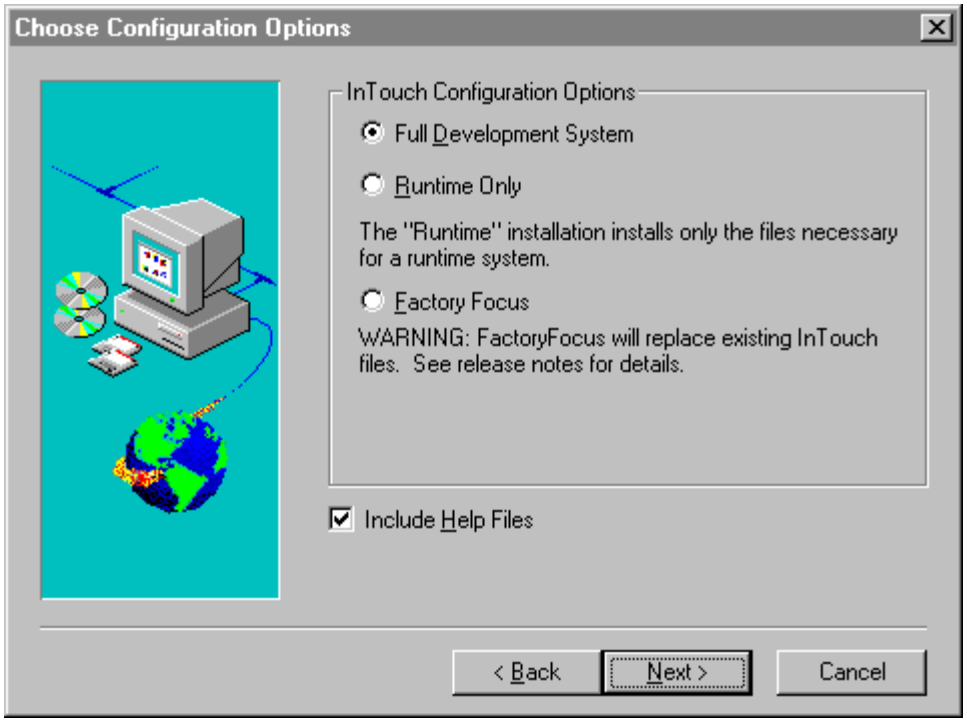
6. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   The **Select Components** dialog box appears.



7. Check the applications and demos that you want to install and click **Next**.

   The **Choose Configuration Options** dialog box appears.



8. Click the desired configuration option.

   Full Development System
   All tools for creating and running an HMI application.

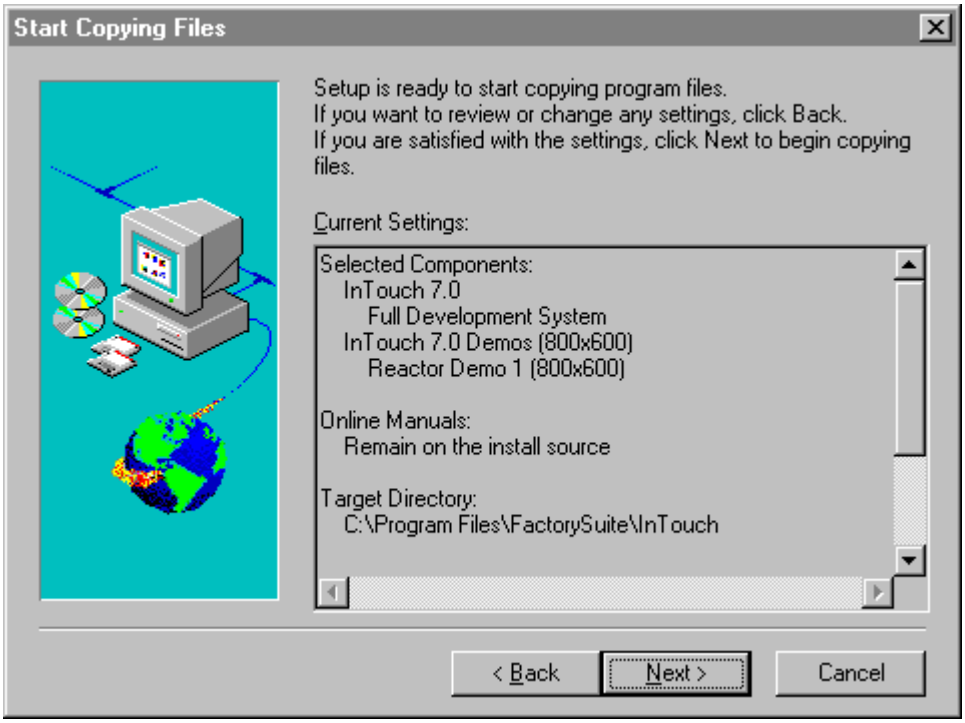
   Runtime Only
   Program used by the plant floor operator to interact with the HMI application in real-time.

   Factory Focus
   View-only version of InTouch runtime.

   Include Help Files
   All Help files for the selected option will be installed to hard disk.

17. Click **Next**.

    The **Start Copying Files** dialog box appears.



18. Check that all of the installation details are correct. To change any of the details, use the **Back** button to return to the beginning of the configuration options.

    If all of the current settings are correct, click **Next** to finish the installation.

19. The **Setup Complete** dialog box will appear when installation is complete:

20. Click **OK**.

Installing InControl

During the InControl installation, you can choose to install the following products:

- InControl application, which includes optional wizards for InTouch.
- I/O drivers for supported I/O Servers. The user guide for any I/O driver that you select will automatically be installed.

Note You should un-install any previous versions of InControl prior to performing the installation. See "Un-installing FactorySuite Components" later in this chapter for more information.

If InTouch is not loaded on your system and you want to use it with InControl, you must first install InTouch and then install InControl. InControl must always be installed after InTouch so that the InControl wizards are installed properly.

If InTouch is already installed, the installation program will automatically add InControl to the WindowMaker Application Explorer, allowing you to launch InControl from WindowMaker.

If you intend to use InTouch and InControl on separate systems and need to view the InControl symbols from InTouch, you must install the InControl Tag Browser files on the system where InTouch is located. Run the InControl setup program on the InTouch system and choose **InTouch Extensions** when prompted for the setup option.

Installation

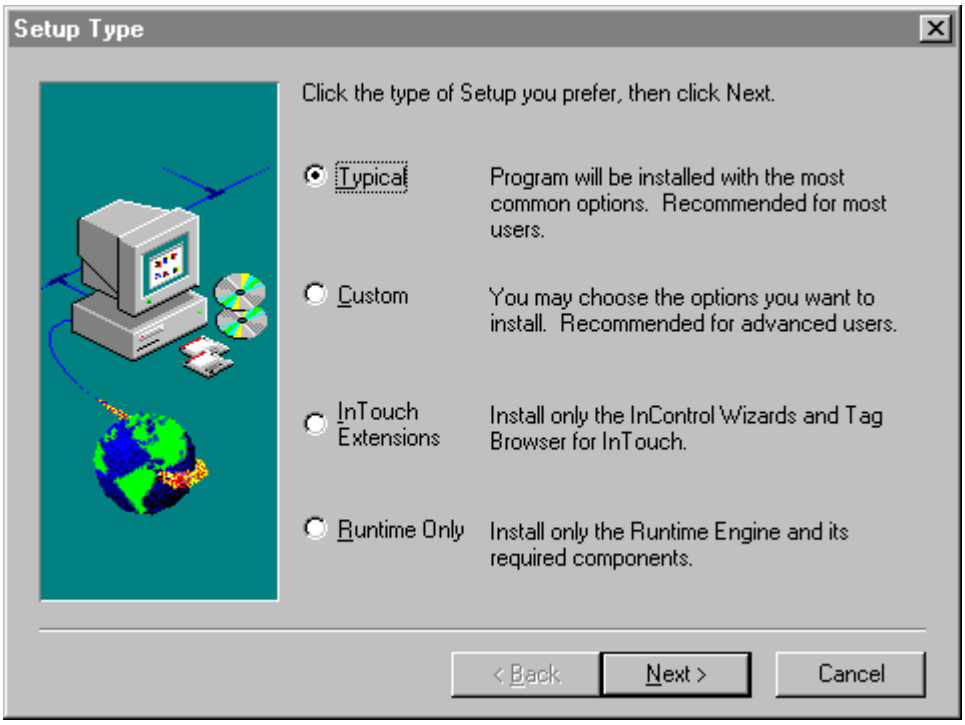
Before installing InControl, log on to your Windows NT system using an account with administrator privileges. Close any programs that are currently running.

➢ **To install InControl:**

1. If you are installing InControl from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install InControl, return to this section and continue with Step 2 to complete the installation.

   If you are installing InControl using the setup program on the InControl CD, double-click SETUP.EXE in the InControl folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

2. The **Setup Type** dialog box appears.



3. Select the type of install to perform

Typical

Automatically installs InControl program files, sample files, InTouch wizards, and user guides. However, you can select which I/O drivers that you want installed.

Go to "Typical/Custom Installation" later in this chapter.

Custom

Allows you to choose which options that you want to install.

Go to "Typical/Custom Installation" later in this chapter.

InTouch Extensions

Installs only the InControl wizards and the InControl Tag Browser for InTouch.

Runtime Only

Installs the runtime engine, I/O drivers that you select, and copies the user guides to the hard disk.

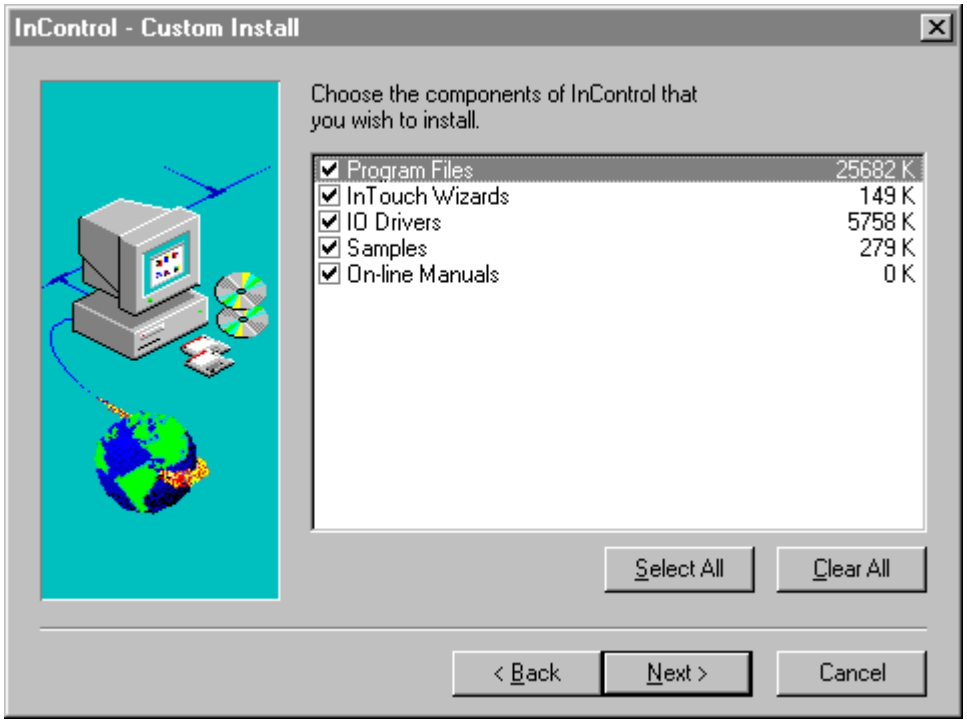
If you click this button, the **Select InControl Directory** dialog box appears, allowing you to configure the destination directory for the InControl files. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

You will also be prompted to select drivers for I/O Servers. At the end of the compact installation, you can select whether or not you want to review the README file.

Typical/Custom Installation

1. If you chose the typical installation, skip to Step 3.

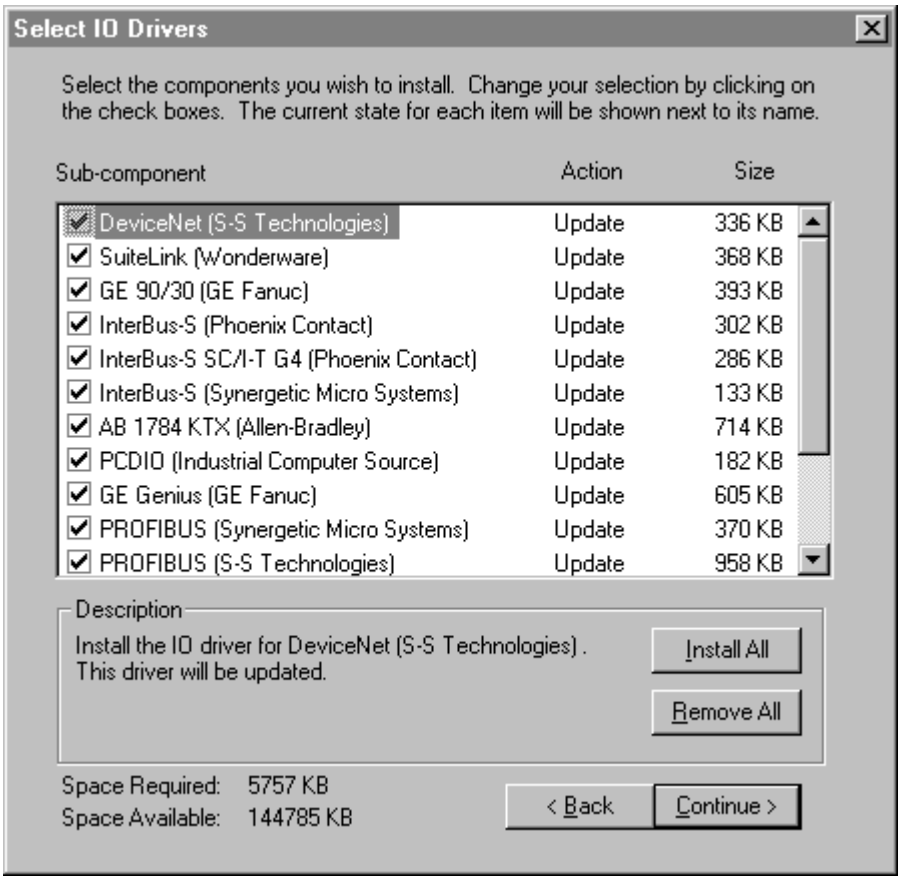
   If you chose the custom installation, the **InControl - Custom Install** dialog box appears.



2. Check the applications and demos that you want to install and click **Next**.
3. The **Select InControl Directory** dialog box appears.
4. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   For more information, see "Common Installation Options" earlier in this chapter.

   The **Select IO Drivers** dialog box appears.



5. Select the drivers for the I/O Servers. The check boxes indicate the following actions by the Setup program:

   ☑ **Checked**
   The driver is either installed or upgraded.

   ☐ **Unchecked**
   The driver is removed if it is installed.

   ☑ **Unavailable**
   No change. If installed, the driver is not upgraded. If not installed, the Setup program does not install the driver.

6. The **FS2000 Common Components** dialog box appears.

7. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the InTouch system.

   For more information, see "Common Installation Options" earlier in this chapter.

8. All required common component and InControl program files will be copied to hard disk and your system will be configured.

   The **Reboot Windows** dialog box appears.

9. Select when to restart the computer in order for the installation to take effect.

   For more information, see "Common Installation Options" earlier in this chapter.

10. Click **Finish**.

    The **Question** dialog box appears.

11. Select whether or not you want to review the README file.

12. Click **OK**.

Upgrading

You must un-install InControl 1.0 before installing InControl 7.0. If you currently have version 1.0 installed on your computer and attempt to install version 7.0 over it, the FactorySuite installation program will stop and issue a warning to un-install the earlier version.

For information on un-installing components, see "Un-Installing a FactorySuite Component" later in this chapter.

Installing IndustrialSQL Server

A complete IndustrialSQL Server system is composed of the following software components:

- Microsoft SQL Server
- IndustrialSQL Server and storage components
- IndustrialSQL Server client tools, including BDE connectivity components
- IndustrialSQL Server online documentation (optional)

If you do not have Microsoft SQL Server installed, you can install it as part of the IndustrialSQL Server installation. Microsoft ISQL/w, MS Query, SQL Enterprise Manager, and the SQL Client Configuration Utility will also be installed. Microsoft SQL Server may be installed on the same computer on which you want to install IndustrialSQL Server, or on a remote computer on the network. If you choose to install Microsoft SQL Server as part of your IndustrialSQL Server installation, the default installation options will be used.

About the Installation

When installing an IndustrialSQL Server, the following operations are performed by the installation program:

- Locate a running Microsoft SQL Server, or else install it from the IndustrialSQL Server CD using the default options.
- If you are using a remote Microsoft SQL Server, locate the Microsoft Client Utilities.
- Log on to the installed Microsoft SQL Server. You must be able to successfully log on to the Microsoft SQL Server to complete the setup.
- Create IndustrialSQL Server directories on the hard disk and copy over system files.
- Deploy the FactorySuite common components, such as SuiteLink, NetDDE extensions, and the Wonderware Logger.
- Create and configure IndustrialSQL Server databases and database devices.
- Populate the IndustrialSQL Server program or startup menu group with icons.

Configuring an Existing Microsoft SQL Server

If you are installing IndustrialSQL Server for use with an existing copy of Microsoft SQL Server currently running on your local computer or on a network computer, you must properly configure certain options on the Microsoft SQL Server. You must configure these options prior to installing the IndustrialSQL Server:

- Dictionary Sort Order: Use any of the case-insensitive sort orders supported by SQL Server, such as the default.
- Network Support: Use named pipes and any other support required at your site.
- Microsoft Client Utilities must be installed on the IndustrialSQL Server computer.

Important! Modifying the dictionary sort order after the installing IndustrialSQL Server will result in a loss of the IndustrialSQL Server databases.

If the existing copy of Microsoft SQL Server is not configured properly, run the Microsoft SQL Server setup program to change these options. Microsoft SQL Server options should only be configured by a qualified Windows NT or SQL Server administrator. For more information, see your Microsoft SQL Server documentation.

Licensing Considerations

On startup, the IndustrialSQL Server system will check to see that a valid Wonderware license file is present on the system. If the license file is not present, the IndustrialSQL Server and the embedded Microsoft SQL Server will run in "demo" mode for one hour and then shut down. If installed by the IndustrialSQL Server installation program, the embedded Microsoft SQL Server cannot be run independently of the IndustrialSQL Server unless a valid license file exists. However, if you installed the IndustrialSQL Server for use with an existing Microsoft SQL Server, that SQL Server will continue to run.

For IndustrialSQL Server systems configured for automatic startup, an error message be written to the error log if the license is missing or has expired. For IndustrialSQL Server systems configured for manual startup, a message will appear to verify startup in demo mode. If a Wonderware license expires while the IndustrialSQL Server system is running, the system will automatically shut down, including the Microsoft SQL Server.

Installation Options

This section describes the installation options for IndustrialSQL Server. During the installation, you will be prompted to make decisions about data storage locations, device sizes, and so on. You should have a definite plan for implementing IndustrialSQL Server in your plant environment before you start the installation process. This plan should include the type of network architecture for the IndustrialSQL Server system, considerations for how much disk space is required for data storage, and the amount of space required for the IndustrialSQL Server database devices and log devices.

Note You must have administrative rights to install IndustrialSQL Server.

Microsoft SQL Server and Client Utilities

The required version of Microsoft SQL Server (version 6.5, service pack 3) must be installed and running on the local computer or a network computer prior to installing IndustrialSQL Server.

Note The Microsoft SQL Server must be upgraded to service pack 3 or else the IndustrialSQL Server installation cannot be completed.

If the IndustrialSQL Server installation program detects that either the Microsoft SQL Server or the required service pack is not installed, you will be given the option to install them as part of the IndustrialSQL Server installation. If you choose to install Microsoft SQL Server, the default installation options will be used, and it will automatically be configured for use with IndustrialSQL Server.

Once IndustrialSQL Server is installed, the installation program is designed to restart the Microsoft SQL Server in order for the installation changes to take effect. Any users connected to the Microsoft SQL Server at that time will be automatically disconnected. A restart is not required for a re-installation of IndustrialSQL Server.

Also, Microsoft SQL Server Client Utilities must be installed on the IndustrialSQL Server computer prior to installation. This applies if choosing to install with a remote Microsoft SQL Server or for client tools. If Microsoft SQL Server Client Utilities are not installed, you will be prompted to install them during the IndustrialSQL Server installation. If you choose to have these utilities installed by the IndustrialSQL Server installation program, the default options will be used. These utilities include ISQL/w, SQL Enterprise Manager, MS Query, the SQL Client Configuration Utility, and the the Microsoft SQL Server books.

Services

The IndustrialSQL Server task runs as a Windows NT service and, as such, can be started and controlled using the Microsoft SQL Service Manager. To run these IndustrialSQL Server processes as services, you must enter the Windows NT logon parameters for the user who will have the rights and responsibility for starting and stopping the IndustrialSQL Server system.

Storage Areas

The IndustrialSQL Server stores blocks of historical data it retrieves from the plant floor to hard disk in files. A history block is data acquired during a particular time span. There are four types of storage areas for use with history blocks: circular, permanent, buffer, and alternate. These areas are described in the following table:

Storage Area	Description
Circular	Used for storing history blocks. The circular storage area consists of a single area, written to in a "circular buffer" fashion. When the free disk space on the disk containing the circular storage area drops below the minimum threshold, the oldest data is deleted out of this storage area and replaced with the new data to be stored.
Alternate	Used as a secondary circular storage area. When the free disk space in the circular storage area goes below the defined threshold, the IndustrialSQL Server system will start moving the oldest history blocks to this area instead of automatically deleting them. An alternate storage area must reside on a different hard disk than the circular storage area. This storage area is optional and must be set up using the Configure program.
Buffer	Used for temporary purposes, such as retrieval from a data archive. This storage area can reside on the same hard disk as the circular storage area, or on a different disk. Data stored in the buffer area can be accessed and viewed along with the data stored in the circular storage area.
Permanent	Used to permanently store copies of history blocks. The block data copy function can be used to move history blocks from the circular area to this area. The permanent storage area can be used with storage media such as a WORM disk.

When planning your data storage strategy for IndustrialSQL Server, be sure to allow enough disk space for storing your plant data for the desired length of time. During the installation, you will be prompted for path to where history data will be stored (the circular, buffer, and permanent storage areas). By default, directories are created in the IndustrialSQL Server root directory (except for the alternate storage area).

📖 For information on specifying a directory for the alternate storage area or for managing storage, see your *IndustrialSQL Server Administrator's Guide*.

IndustrialSQL Server Databases

A database is a system repository of common types of data, sorted by unique identifiers and organized into tables. There are two default IndustrialSQL Server databases:

- The *Runtime* database, which stores all data pertaining to IndustrialSQL Server.
- The *Holding* database, which temporarily stores data being imported from InTouch.

Database Devices

A database device is a file on which databases and their associated transaction logs are stored. All database devices have a .DAT extension. A single device can hold a portion of one or more databases, and a single database can be stored across multiple devices. There are two IndustrialSQL Server database devices that are created during installation:

- The IndustrialSQL Server data device, which stores data for both the *Runtime* and *Holding* databases.
- The IndustrialSQL Server log device, which stores transaction logs for both the *Runtime* and *Holding* databases.

Note For IndustrialSQL Server, the database devices store all information except for historical plant data. Historical data is stored in a block format in files in the circular storage area. This method of historical data storage is specific to IndustrialSQL Server.

By default, IndustrialSQL Server is configured to use the following amount of space for each database device for each type of installation:

	Small (500 Tags)		Medium (5000 Tags)		Large (5000+ Tags)	
	Data Device	**Log Device**	**Data Device**	**Log Device**	**Data Device**	**Log Device**
Runtime database	20 MB	10 MB	30 MB	25	70 MB	35 MB
Holding database	15 MB	10 MB	25	20	25 MB	12 MB
tempdb database[1]	Between 2 and 8 MB.	--	Between 2 and 8 MB.	--	Between 2 and 8 MB.	--
Total Space Used (Minimum)	37 MB	20 MB	57 MB	45 MB	97 MB	47 MB

[1] The default size of the *tempdb* database is 2 MB. The *tempdb* database will be extended to 10 MB in a device called *tempdbext* if *tempdb* is less than 10 MB.

You cannot change these defaults during the installation. The databases can be resized later using Microsoft SQL Server utilities. For more information on sizing database devices, see your Microsoft SQL Server documentation for guidelines.

IndustrialSQL Server Installation

This section describes how to install the IndustrialSQL Server and storage system components. It is assumed that you are familiar with the installation concepts explained earlier in this chapter.

Note You must have administrative rights to install IndustrialSQL Server.

➢ **To install the IndustrialSQL Server and storage system:**

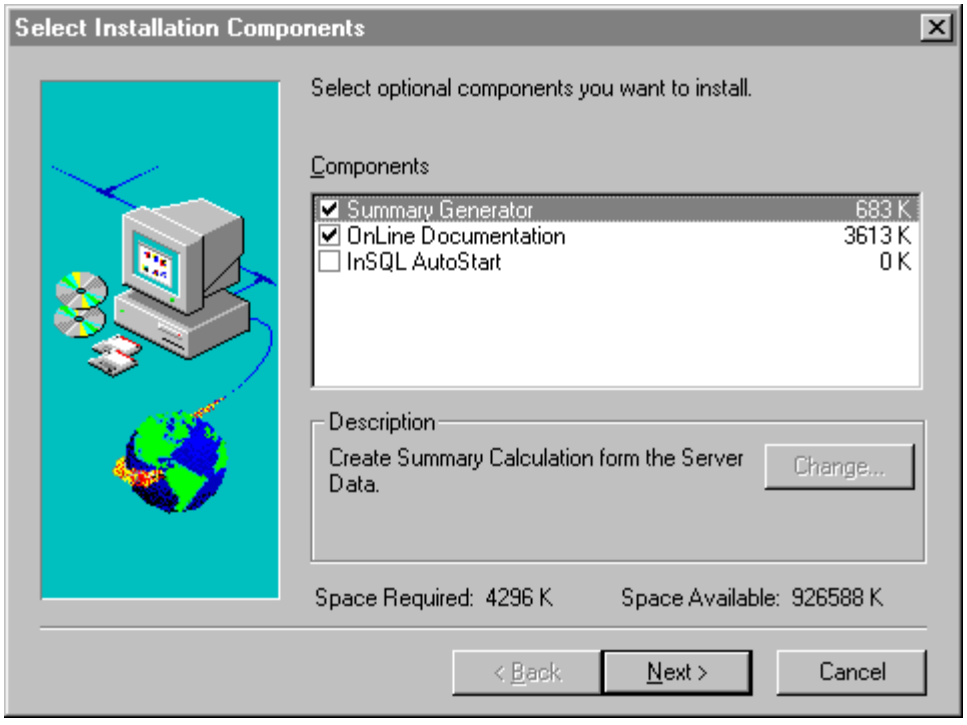
1. If you are installing IndustrialSQL Server from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install the IndustrialSQL Server, return to this section and continue with Step 2 to complete the installation.

   If you are installing IndustrialSQL Server using the setup program on the IndustrialSQL Server CD, double-click SETUP.EXE in the IndustrialSQL Server folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

2. If IndustrialSQL Server has not currently installed, the **Choose Destination Location** dialog box appears.

3. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   The **Select Installation Components** dialog box appears.



4. Check the IndustrialSQL Server components that you want to install and click **Next**.

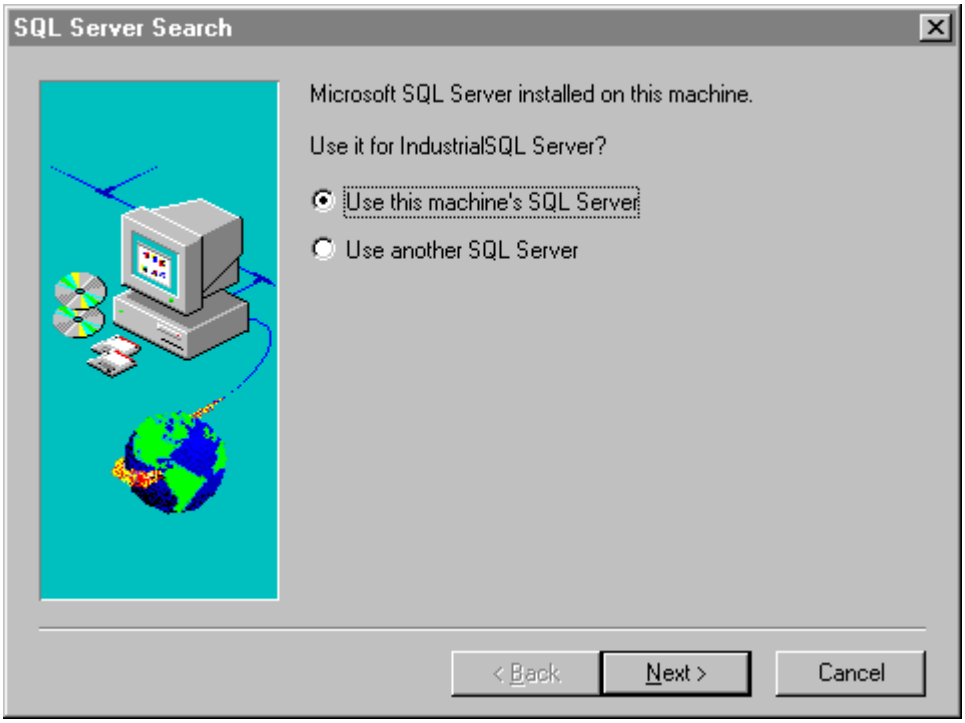
   If you select the **InSQL AutoStart** option, the Control service will automatically be started when the computer on which IndustrialSQL Server is installed is started.

Note If you are re-installing IndustrialSQL Server 7.0, the you will be given the option to rebuild the databases in this dialog box.

5. The installation program will automatically search for a copy of Microsoft SQL Server on the local computer.

   If a Microsoft SQL Server is installed on the local machine, the **SQL Server Search** dialog box appears, allowing you to choose the local copy or to specify another copy on the network.

   If no Microsoft SQL Server was found, skip to Step 7.

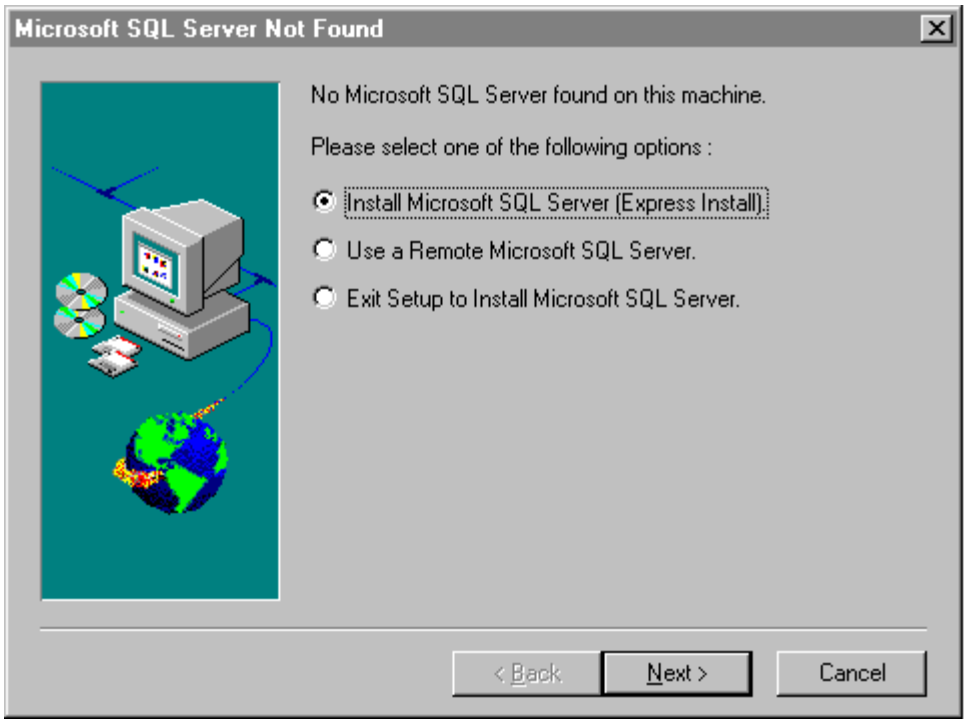


6. To use the local copy, click the **Use this machine's SQL Server** option and then click **Next**.

   To use another copy, click the **Use another SQL Server** option and then click **Next**.

   Skip to Step 9.

7. If Microsoft SQL Server was not found on the local computer, the following dialog box appears:



8. Select the appropriate option and click **Next**.

   Install Microsoft SQL Server (Express Install)
   Choose this option to automatically install Microsoft SQL Server with all default options. You must specify a destination directory for Microsoft SQL Server files and the appropriate network protocol (if other than named pipes). After the express installation, you will be prompted to log on to the server.

   Use a Remote Microsoft SQL Server
   Choose this option to specify a copy of Microsoft SQL Server on the network. You will be required to specify the server name and provide a password to log on to the server.

   Exit Setup to Install Microsoft SQL Server
   Choose this option to install Microsoft SQL Server from the Microsoft SQL Server CD. Choosing this option will allow you to perform a custom setup of Microsoft SQL Server. For more information, see your Microsoft documentation.

9. All FactorySuite common components will then be installed.

   The **FS2000 Common Components** dialog box appears.

10. By default, the IndustrialSQL Server processes run as Windows NT services. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the IndustrialSQL Server system.

    For more information, see "Common Installation Options" earlier in this chapter.

11. Click **Next**.

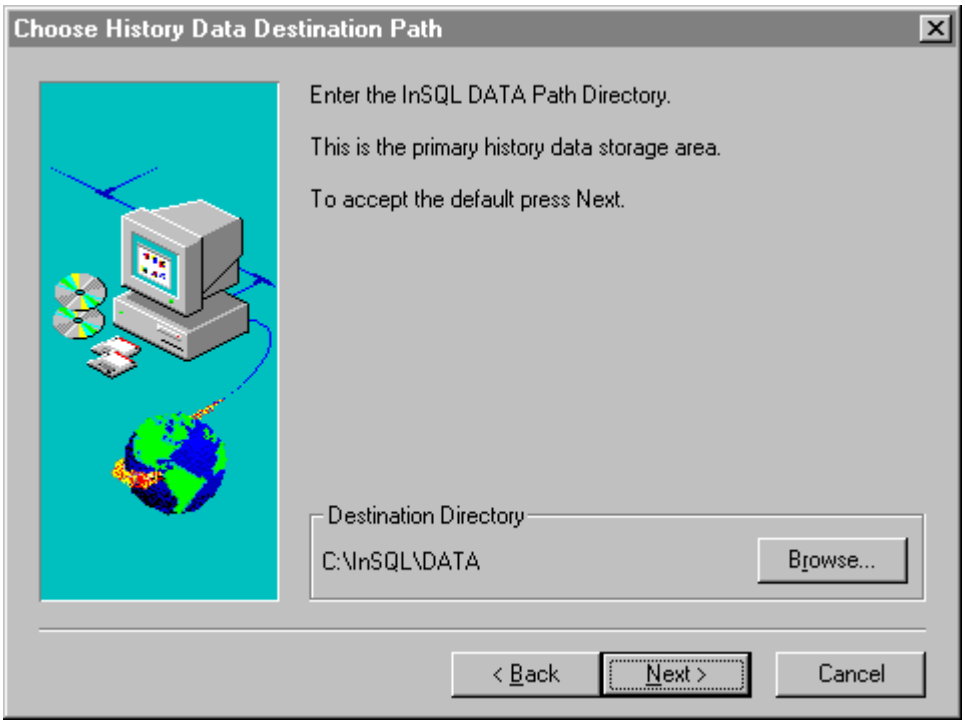
    All required IndustrialSQL Server common component files and product files will be copied to hard disk and your system will be configured.

    The **Logon** dialog box appears.

12. If you chose to use the local Microsoft SQL Server, enter the logon password. Click **Next**.

    If you chose to use the local Microsoft SQL Server, enter the remote Microsoft SQL Server name and the logon password. (This option is not recommended since this SQL Server will be stopped and restarted. Any clients connected to the SQL Server at that time will be disconnected.) Click **Next**.

    The **Choose History Data Destination Path** dialog box appears:



13. Specify the destination directory in which to store historical data. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

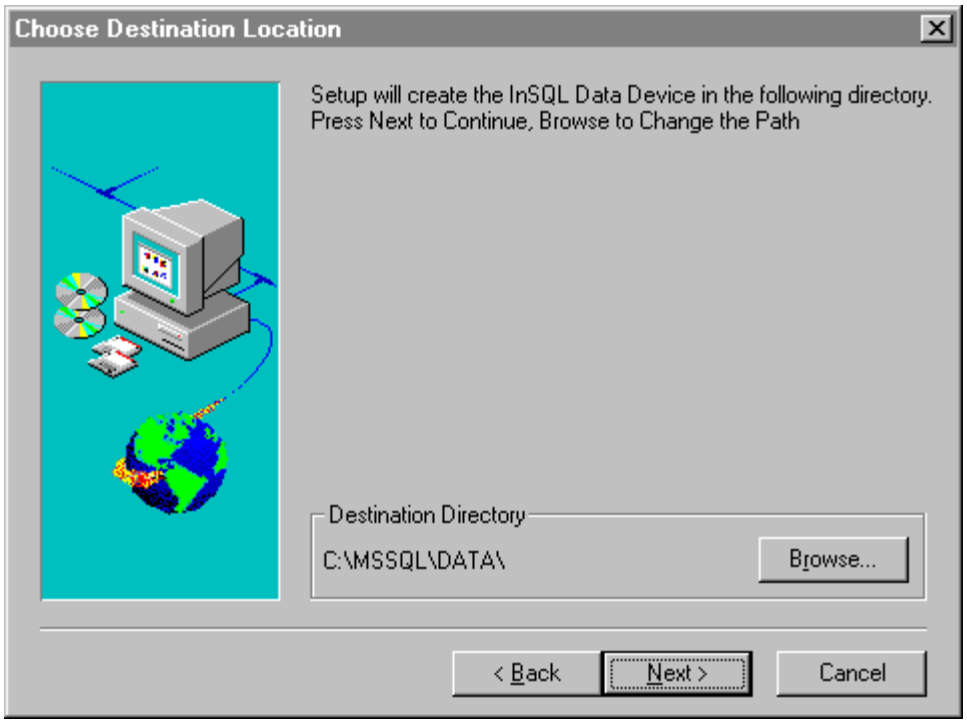
    The storage areas will automatically be configured as follows for the default area:

Circular storage area:	C:\InSQL\Data\Circular
Buffer storage area:	C:\InSQL\Data\Buffer
Permanent storage area:	C:\InSQL\Data\Permanent

    Note The alternate path is not configured by the setup program. This must be done using the Configure program after the IndustrialSQL Server is installed.

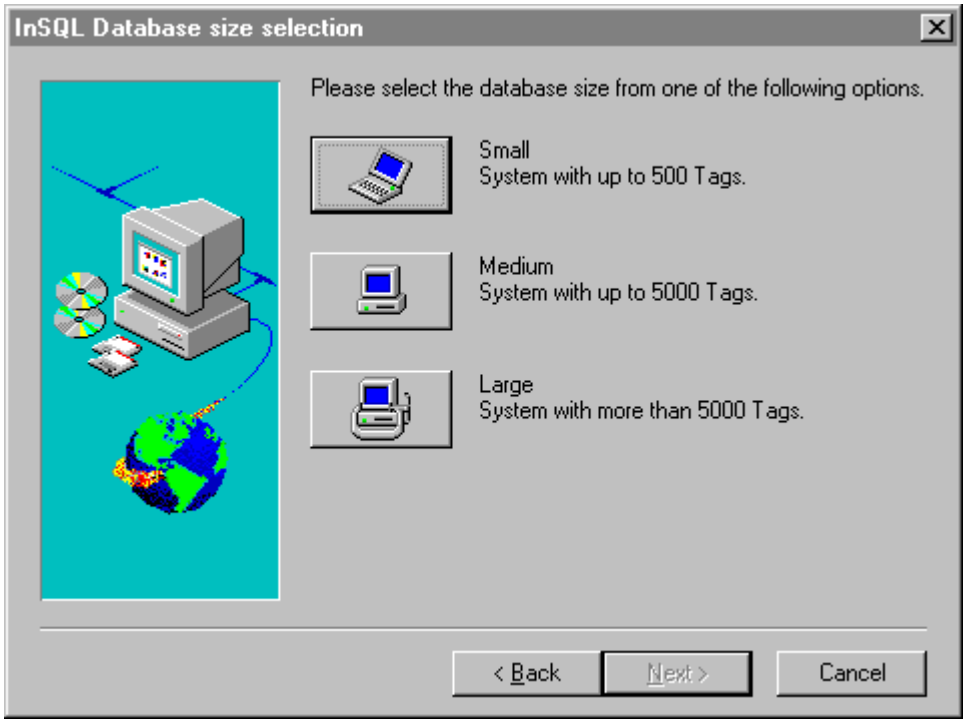
    If you are performing a first-time installation (not a re-install), you will be prompted to restart the Microsoft SQL Server. Click **OK** to restart the Microsoft SQL Server.

14. The **Choose Destination Location** dialog box appears.



15. Specify the destination directory in which to store the data devices. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

    The **InSQL Database Size Selection** dialog box appears.

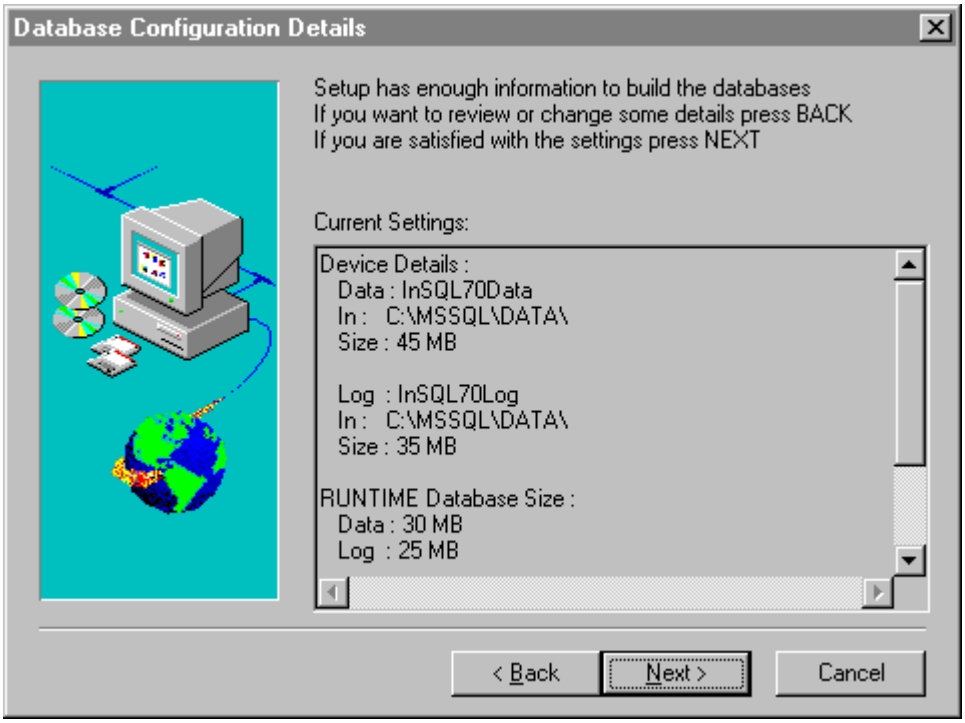


16. Click the button that corresponds with the size of your system.

    The data device (which stores the databases) and the log device (which stores the transaction log files) will automatically be created in the SQL Server and sized according to your selection. If the devices already exist, you will be given the option of deleting them and creating new devices.

    For more information, see "Database Devices" earlier in this chapter.

    The **Database Configuration Details** dialog box appears.



17. Check that all of the IndustrialSQL Server installation details are correct. To change any of the details, use the **Back** button to return to the beginning of the configuration for server details.

18. If all of the current settings for the IndustrialSQL Server are correct, click **Next** to run the SQL scripts to configure the IndustrialSQL Server:

19. If any errors occur, the installation program will stop and an error message will appear, stating the cause of the error. For all error messages, you will be given the choice to Retry, Abort, or Continue with the installation. If you choose to continue with the installation after one or more errors, a final verification dialog box will appear at the end of the script execution sequence.

    The **Setup Complete** dialog box will appear when installation is complete:

20. Click **OK**.

Testing the Installation

You should first test the IndustrialSQL Server installation to make sure that everything was installed correctly and is working properly. To test the installation, you should perform the following steps:

1. Start up the IndustrialSQL Server.
2. Start up the storage system and check to see that the system is receiving data from the system tags.

The IndustrialSQL Server and storage system can be started using the IndustrialSQL Control program. IndustrialSQL Control can also be used to monitor the amount of data being received by the system. Run the IndustrialSQL Control program and click the **Go** button on the main toolbar.

📖 For more information on using IndustrialSQL Control, see your *IndustrialSQL Server Administrator's Guide*.

Configuring the IndustrialSQL Server

Once the IndustrialSQL Server is installed, no additional configuration is required to run the IndustrialSQL Server client tools against the server using the default named pipes network protocol. However, you may want to alter the system or server configuration using the IndustrialSQL Configure program. You can also configure the server to run on a different protocol.

📖 For information on configuring the IndustrialSQL Server, see your *IndustrialSQL Server Administrator's Guide*.

Re-Installing the IndustrialSQL Server

Re-installing the IndustrialSQL Server and storage system is almost identical to an initial installation. The installation program will automatically detect if you have an existing copy of IndustrialSQL Server 7.0 on your system.

During a re-install, you will be given the choice to rebuild the IndustrialSQL Server databases. Message boxes will appear informing you that a database or log device already exists, and that any existing devices will be dropped in order that the new devices can be created. **Any information contained in these devices will be lost.** If you want to retain any of the information in existing databases or log devices, you must first make a backup.

Removing IndustrialSQL Server

When you remove an IndustrialSQL Server installation, the Borland Database Engine (BDE) entries will not be deleted. Most of the InSQL entries in the Windows NT Registry will be deleted, but not all of them. You may delete these entries manually by using the Windows NT Registry Editor (REGEDT32.EXE).

You have the option of keeping the Microsoft SQL Server databases and devices, which is where the IndustrialSQL Server configuration tables are stored. If you choose to delete the databases and devices, the un-install program will prompt you to enter logon information for the Microsoft SQL Server so the databases and devices can be dropped. Dropping a database or device requires restarting the SQL Server.

You also have the option of keeping the IndustrialSQL Server history blocks, which is where all historical data is stored.

For instructions on removing IndustrialSQL Server, see "Un-Installing a FactorySuite Component" later in this chapter.

Upgrading IndustrialSQL Server

The IndustrialSQL Server installation program will detect if you are currently running IndustrialSQL Server 3.0 and will prompt you to make a choice on how you want to migrate the IndustrialSQL Server *Runtime* database. If you are upgrading IndustrialSQL Server 3.0 to version 7.0, you have two options:

- Install a new *Runtime* database for IndustrialSQL Server 7.0.

  If you choose this option, the existing IndustrialSQL Server 3.0 *Runtime* database will be renamed and saved in the existing data devices. A new *Runtime* database for IndustrialSQL Server 7.0 will be created and stored in new data devices. If you select this option, you will have to re-import configuration data (I/O Servers, tag definitions, and so on) into the new database using the Configure program.

  The installation routine for upgrading is similar to a normal installation.

- Migrate the existing IndustrialSQL Server 3.0 *Runtime* database.

  If you choose this option, the setup program will migrate the existing version 3.0 *Runtime* database to support the new version 7.0 database schema. If you select this option, any configuration data (I/O Servers, tags, and so on) will be preserved. **Backing up the Runtime database before you migrate is highly recommended.**

  The installation routine for upgrading is similar to a normal installation. However, since all of the previous settings for version 3.0 are used, you will not be prompted to select a database size. Also, at the end of the installation, you will be prompted to remove all unnecessary IndustrialSQL Server 3.0 files.

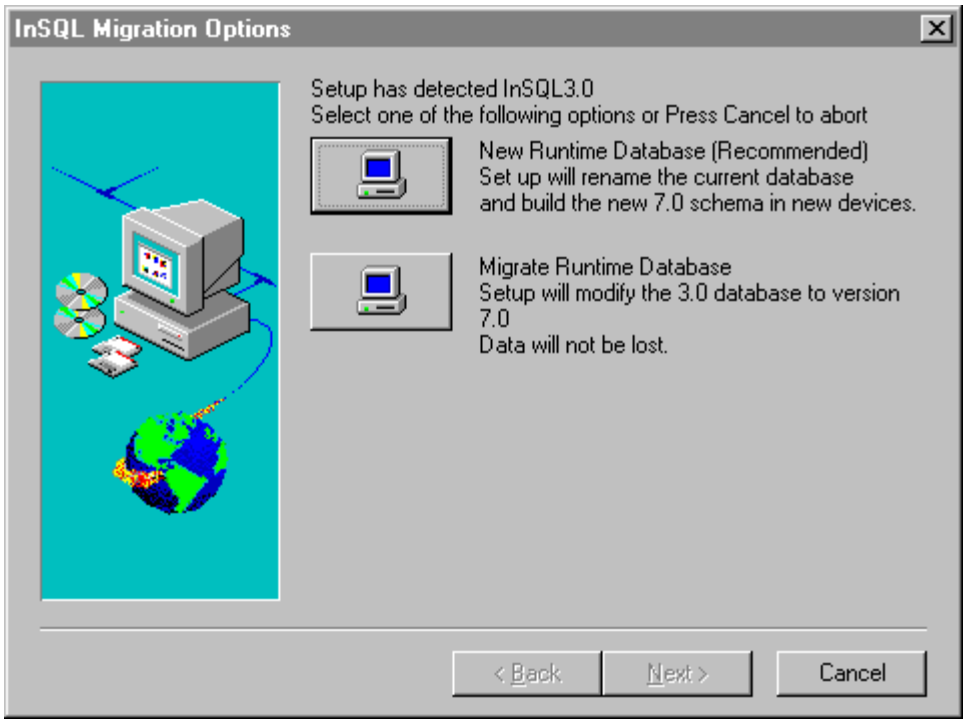
For more information on installation, see "IndustrialSQL Server Installation" earlier in this chapter.

➢ **To upgrade from IndustrialSQL Server 3.0:**

1. If you are installing IndustrialSQL Server from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install the IndustrialSQL Server, return to this section and continue with Step 2 to complete the installation.

   If you are installing IndustrialSQL Server using the setup program on the IndustrialSQL Server CD, double-click SETUP.EXE in the IndustrialSQL Server folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

   The **SQL Migration Options** dialog box appears.



2. Select from the migration options.

New Runtime Database

Installs a new *Runtime* database for version 7.0. The existing IndustrialSQL Server 3.0 *Runtime* database will be renamed and saved in the existing data devices. If you select this option, you will have to import all of the version 3.0 configuration data (I/O Servers, tag definitions, and so on) into the new database using the Configure program.

Migrate Runtime Database

Changes the existing version 3.0 *Runtime* database to support the new version 7.0 database schema. If you select this option, any configuration data (I/O Servers, tags, and so on) will be preserved.

Client Installation

This chapter provides instructions for installing the IndustrialSQL Server 7.0 client tools on a computer running either the Windows 95 or Windows NT operating system. All client applications are 32-bit applications. The IndustrialSQL Server clients include the following applications:

- Configure
- Trend and ActiveTrend
- QuickLook
- VectorMaster and VectorViewer
- ActiveEvent

The following operations are performed by the installation program:

- Installs the Microsoft Client Utilities, if they are not already installed. Also installs the Microsoft SQL Server books, if they are not already installed.
- Creates IndustrialSQL client directories on the hard disk and copies over client files.
- Populates the IndustrialSQL program or startup menu group with icons.

📖 For information on configuring an installed client, see the *IndustrialSQL Server Administrator's Guide*.

Microsoft SQL Server Client Utilities

If no Microsoft SQL Server client utilities are detected, the IndustrialSQL Server installation program will install them. Microsoft ISQL/w, SQL Enterprise Manager, MS Query, and the SQL Client Configuration Utility will be installed.

📖 Refer to your Microsoft documentation for more information on these client utilities.

- The Microsoft SQL Server client software includes configuration utilities which display the DB-Library version installed on your system, set the default Net-Library, and set up server connection information. Three versions of the utility are available for Windows NT, Windows and OS/2 clients. DOS based clients use a Terminate and Stay Resident (TSR) program. Since only one TSR can be loaded at a time, no client configuration utility is included. Follow the instructions in the Microsoft documentation.
- The IndustrialSQL Server usually listens on the default named pipe, on the default IPX/SPX connection, and on the configured TCP/IP socket. No special configuration of the clients is required when using named pipes or IPX/SPX.

You can connect to the IndustrialSQL Server with any application that provides native support for Microsoft SQL Server.

Installing IndustrialSQL Clients

This section describes how to install the IndustrialSQL Server client tools. Client tools can be installed on the same computer as the IndustrialSQL Server, or on a different computer on the network.

Note The Borland Database Engine (BDE) connectivity software must be installed on each computer that will run an IndustrialSQL Server client program. If BDE is not currently installed on the client computer, the IndustrialSQL Server installation program will automatically install these files. If BDE is installed, the installation program will prompt you to overwrite the existing copy.

➢ **To install the IndustrialSQL Server client tools:**

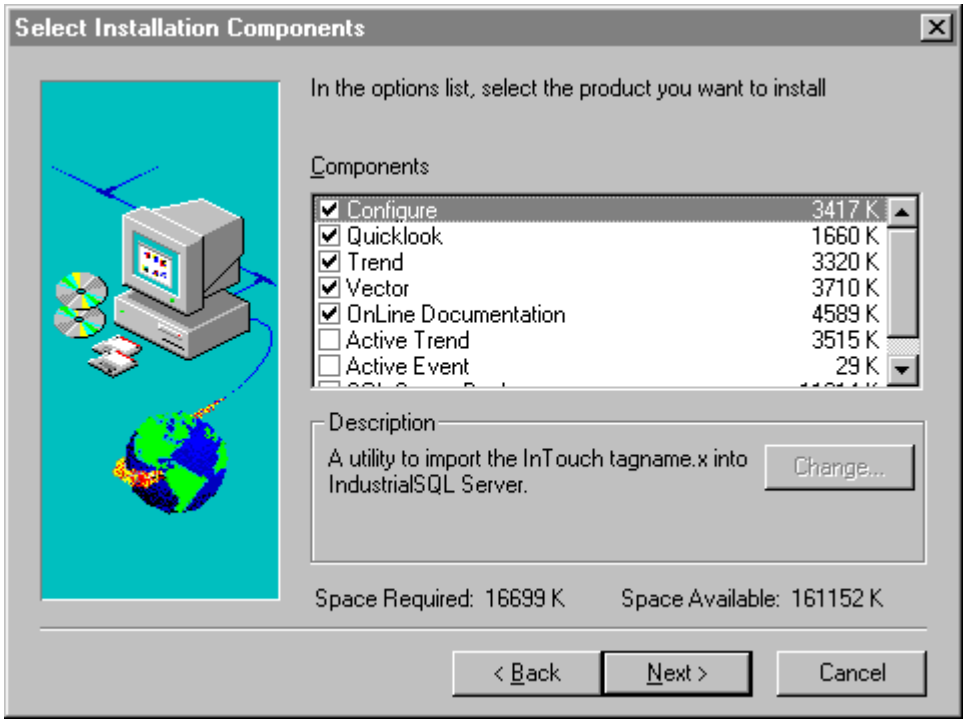
1. Start the installation program as described in "Running the Master Installation Program" earlier in this chapter.

   After confirming the registration information, the **Choose Destination Location** dialog box appears.

   ✍ For more information, see "Common Installation Options" earlier in this chapter.

2. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   The **Select Installation Components** dialog box appears.



3. Check the client applications that you want to install and click **Next**.

   The **Information** box will appear when installation is complete.

4. Click **OK**.

To remove an IndustrialSQL client tool, see "Un-Installing a FactorySuite Component" later in this chapter.

Configuring Installed Clients

The IndustrialSQL Server incorporates Microsoft SQL Server for Windows NT. Client applications see the IndustrialSQL Server as an extremely large real-time Microsoft SQL Server.

IndustrialSQL client/server connections are set up in the same way as Microsoft SQL Server connections. Once the IndustrialSQL Server client tools are installed, no additional configuration is required to run them against the IndustrialSQL Server if you are using the default network protocol (named pipes).

However, you can change the client configuration parameters by using the SQL Server Client Configuration Utility on client computers running the Windows 95 or Windows NT operating systems. The IndustrialSQL Server supports clients using Net-Libraries for named pipes, IPX/SPX, TCP/IP sockets, and any other protocol supported by Microsoft SQL Server.

📖 For more information on configuring clients, see the *IndustrialSQL Server Administrator's Guide*.

Installing InBatch

During the InBatch installation, you can choose to install the following products:

- **InBatch Server**, which includes all of the configuration and runtime applications required to store and manage all batch-related data.
- **InBatch Development Client**, which is made up of the batch configuration editors that are used to define the batch production process. This includes modeling, materials, recipes, reports, security, and process logging.
- **InBatch Runtime Client**, which includes the applications used by the plant floor operator to interact with the batch process in real-time. This includes InBatch scheduling, monitoring, control, and reporting applications as well as files that make InTouch batch aware.
- **Seagate Crystal Reports Professional**, which is a third-party reporting tool used to develop and execute batch reports.

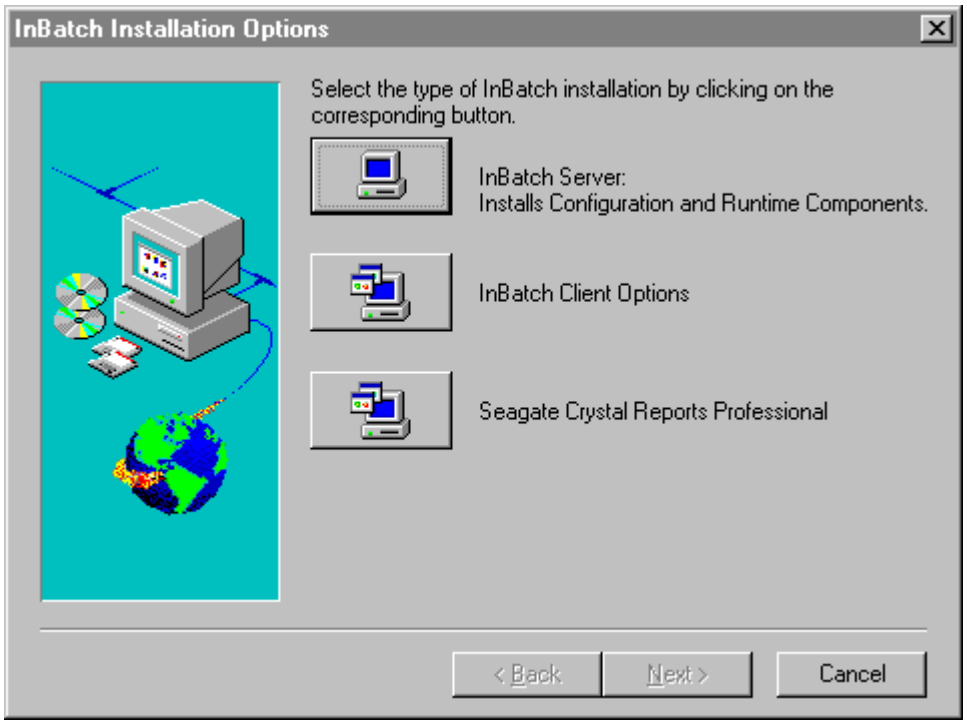
Installation

➢ **To install InBatch:**

1. If you are installing InBatch from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install InBatch, return to this section and continue with Step 2 to complete the installation.

   If you are installing InBatch using the setup program on the InBatch CD, double-click SETUP.EXE in the InBatch folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

2. The **InBatch Installation Options** dialog box appears.



3. Select the application to install.

InBatch Server
Contains all databases and applications used to store and manage all batch-related data.

Go to "Installing an InBatch Server" later in this chapter for information on installing the InBatch Server.

InBatch Client Options
Allows you to install either the InBatch Development Client or InBatch Runtime Client. If you click this button, the **InBatch Client Options** dialog box appears, in which you can make your selection.

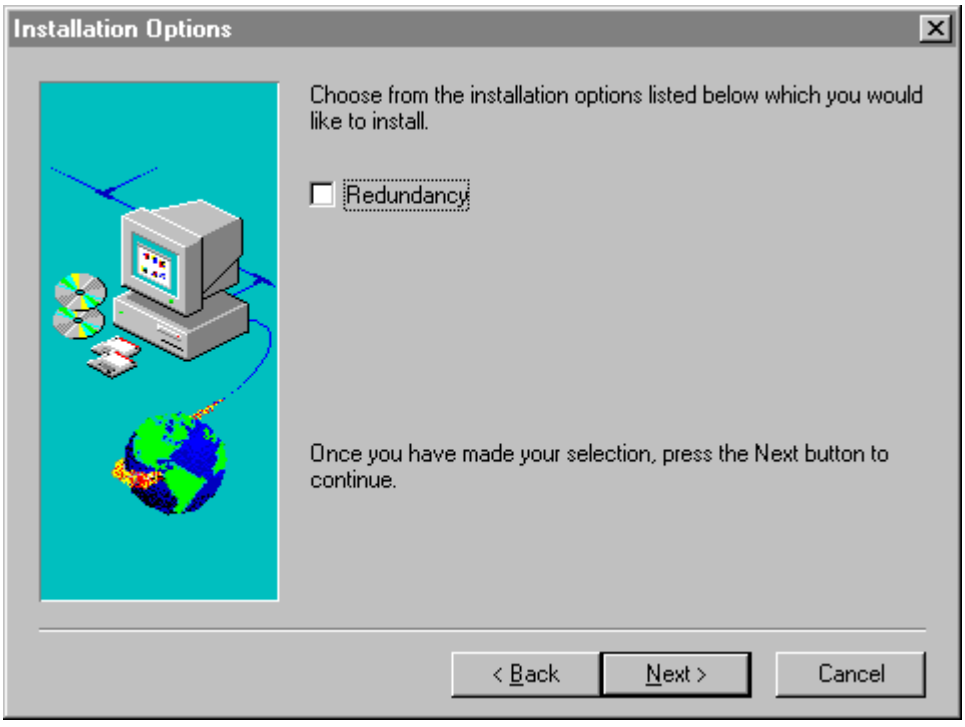
Go to either "Installing the InBatch Development Client" or "Installing the InBatch Runtime Client" later in this chapter for information on installing clients.

Seagate Crystal Reports Professional
Third-party reporting tool. If you choose this option, the Crystal Reports installation program will start up.

Installing the InBatch Server

1. If InBatch is not currently installed, the **InBatch Installation Location** dialog box appears.
2. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   ☞ For more information, see "Common Installation Options" earlier in this chapter.
3. The **Installation Options** dialog box appears.



4. To install InBatch as a redundant server, click **Redundancy**.

   ☞ For more information on installing and configuring a redundant InBatch server, see Chapter 4, "Component Networking Options."

5. Click **Next**.

   All InBatch program files will be copied to hard disk.

   The **FS2000 Common Components** dialog box appears.

6. Some of the InBatch processes run as Windows NT services. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the InBatch system.

   For more information, see "Common Installation Options" earlier in this chapter.

7. Click **Next**.

   All required common component files will be copied to hard disk and your system will be configured.

   The **Installation Complete** dialog box appears.

8. Select when to restart the computer in order for the installation to take effect.

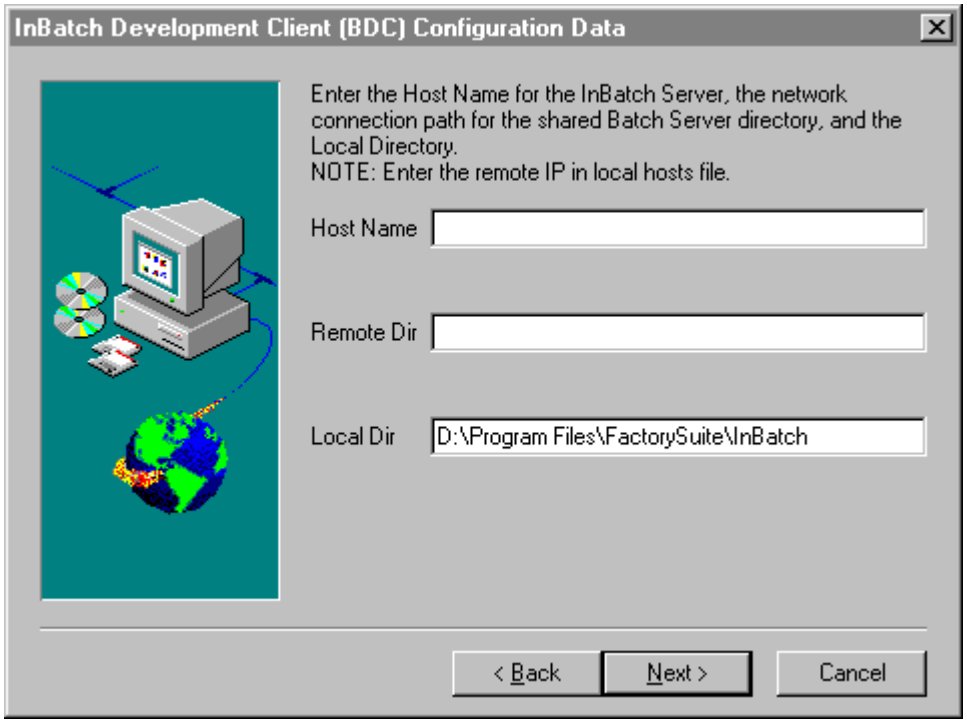
   For more information, see "Common Installation Options" earlier in this chapter.

9. Click **Finish**.

Installing an InBatch Development Client

You cannot install the InBatch Development Client on the same computer as the InBatch Server.

1. The **InBatch Development Client (BDC) Configuration Data** dialog box appears.



2. Enter the configuration data.

   Host Name
   Name of the remote computer on which the InBatch Server is running.

   Remote Dir
   The drive letter that is mapped to the directory on the remote computer in which the InBatch Server files are installed. This directory must be made available (shared) on the batch server and accessible to other computers on the network. To establish a connection from the InBatch client computer, map a network drive letter to the InBatch Server directory in Windows Explorer. Use this drive letter in the **Remote Dir** box.

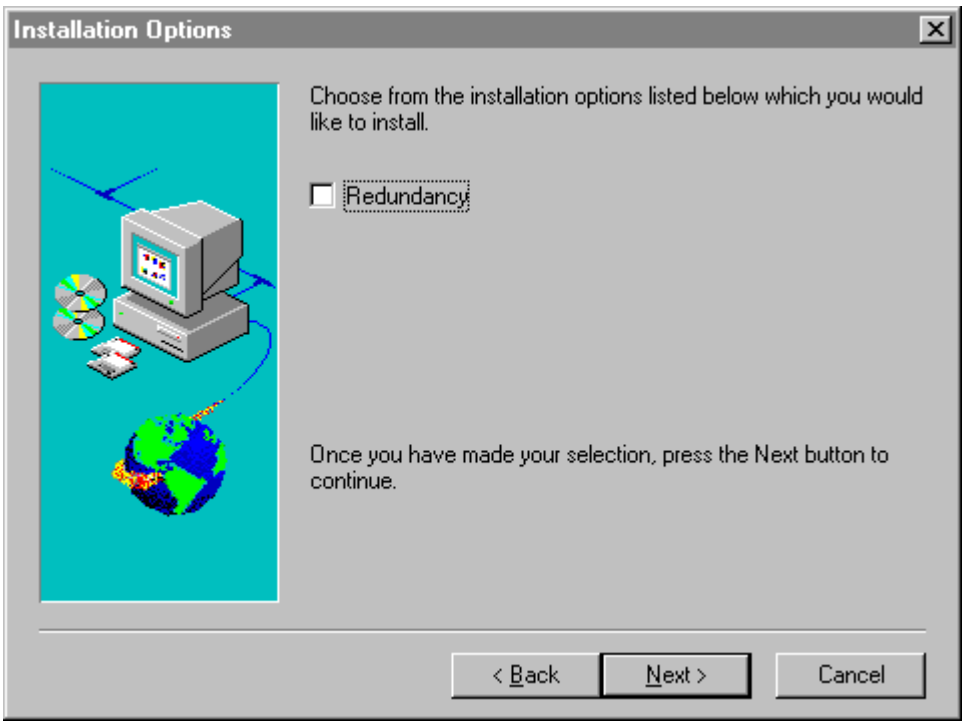
   For example, share the directory (*C:\Program Files\FactorySuite\InBatch*) on the Batch Server and then map to the InBatch directory on the client (*F:).* The **Remote Dir** setting would then point to this share (*F:*\).

   Local Dir
   Directory in which the InBatch client files will be installed.

Note Remember to enter the IP network address for the batch server in the *Hosts* file of the InBatch Development Client.

3. Click **Next**.

   The **Installation Options** dialog box appears.



4. To install InBatch to work with a redundant server, click **Redundancy**.

   ☞ For more information on installing and configuring a redundant InBatch server, see Chapter 4, "Component Networking Options."

5. Click **Next**.

   All InBatch program files will be copied to hard disk.

   The **FS2000 Common Components** dialog box appears.

6. Some of the InBatch processes run as Windows NT services. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the InBatch client.

   For more information, see "Common Installation Options" earlier in this chapter.

7. Click **Next**.

   All required InBatch common component files will be copied to hard disk and your system will be configured.

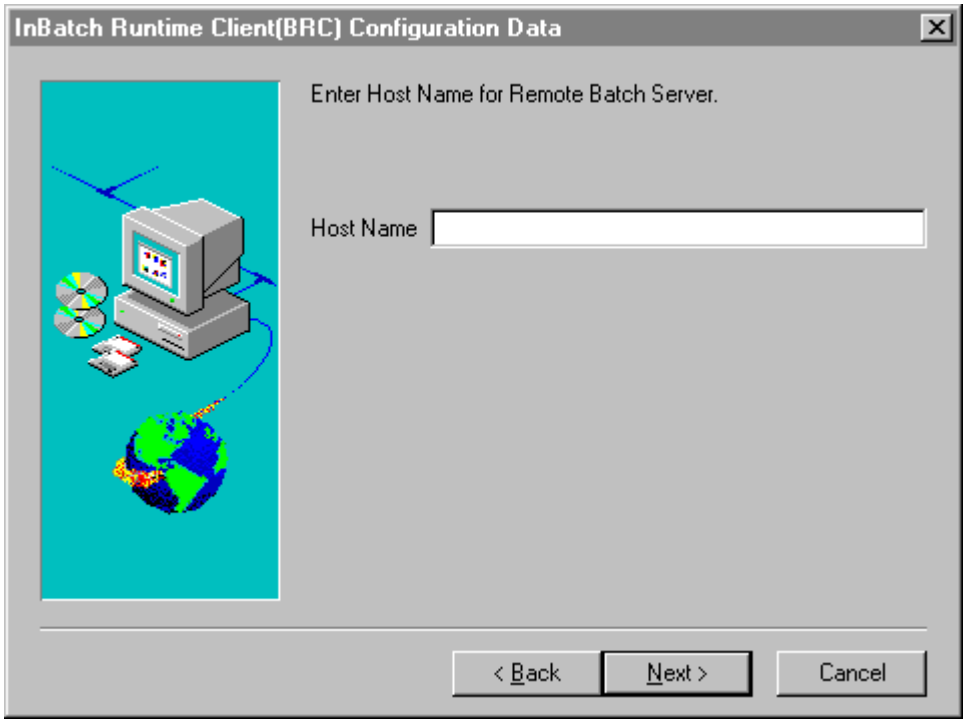
   The **Installation Complete** dialog box appears.

8. Select when to restart the computer in order for the installation to take effect and then click **Finish**.

Installing an InBatch Runtime Client

You must install InTouch prior to installing the InBatch Runtime Client.

1. Upon selection of the InBatch Runtime Client option, batch wizards and required extensions are installed within InTouch.
2. The **InBatch Runtime Client (BRC) Configuration Data** dialog box appears.

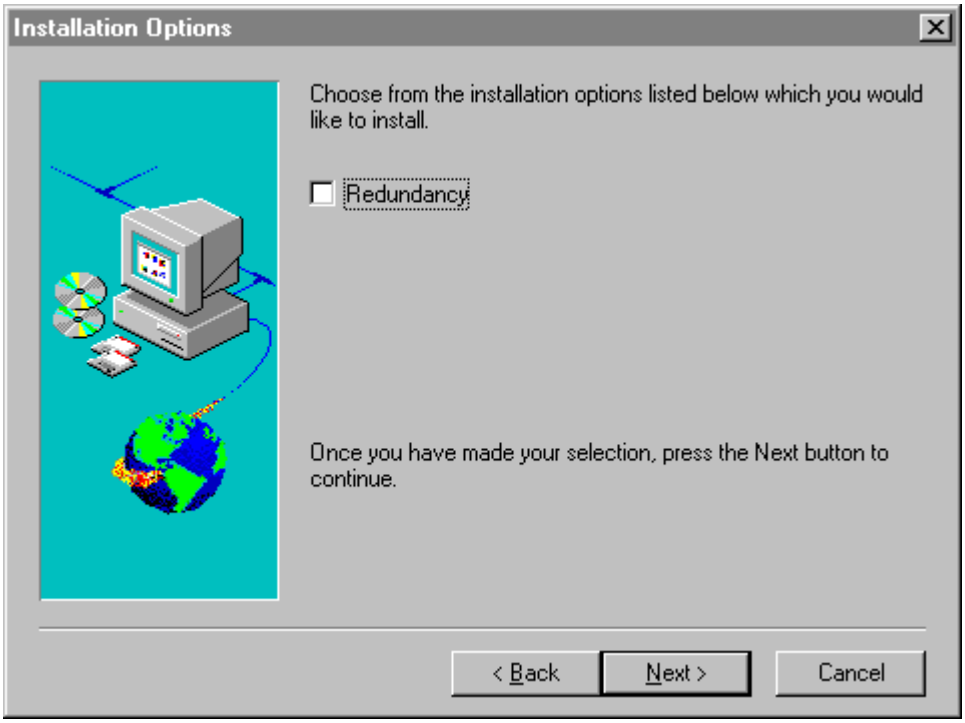


3. Enter the computer name for the remote InBatch Server and click **Next**.
4. The **InBatch Installation Location** dialog box appears.

   For more information, see "Common Installation Options" earlier in this chapter.

5. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   The **Installation Options** dialog box appears.



6. To install the InBatch client for use with a redundant InBatch server, click **Redundancy**.

   ✍ For more information on installing and configuring a redundant InBatch server, see Chapter 4, "Component Networking Options."

7. Click **Next**.

   All InBatch program files will be copied to hard disk.

   The **FS2000 Common Components** dialog box appears.

8. Some of the InBatch processes run as Windows NT services. Enter logon parameters for the user who will have the rights and responsibility for starting and stopping the InBatch client.

   ✍ For more information, see "Common Installation Options" earlier in this chapter.

9. Click **Next**.

   All required InBatch common component files will be copied to hard disk and your system will be configured.

   The **Installation Complete** dialog box appears.

10. Select when to restart the computer in order for the installation to take effect and then click **Finish**.

Configuring InBatch History

InBatch uses Microsoft SQL Server 6.5 for storing batch historical information. You must install Microsoft SQL Server prior to running InBatch. Microsoft SQL Server can be installed by following the directions for installing IndustrialSQL Server earlier in this chapter. Microsoft SQL Server can be installed on the same machine as an InBatch component or on a separate machine.

Notes when installing Microsoft SQL Server.

- Install Database and utilities.
- Default sort order of Dictionary case-insensitive.
- Default communications using named pipes.
- Default Master Database size.
- The service logon should use a DBA/Administrator defined account when running in a domain. Services should automatically start. If you choose to use manual start, remember this when connections fail.

Required Steps

Configuring InBatch history requires six basic steps. Several of the steps correspond directly to SQL Server. The remaining steps must be performed for each InBatch Server and InBatch Runtime Client. Each is explained more completely in the pages that follow.

1. Define database devices in SQL Server. (SQL Server only)
2. Define databases in SQL Server. (SQL Server only)
3. Build the InBatch history and archive databases. (SQL Server only)
4. Secure the database. (SQL Server Only)
5. Configure Windows ODBC. (InBatch Server and InBatch Runtime Client Only)
6. Use the InBatch History Administration application. (InBatch Server and InBatch Runtime Client Only)

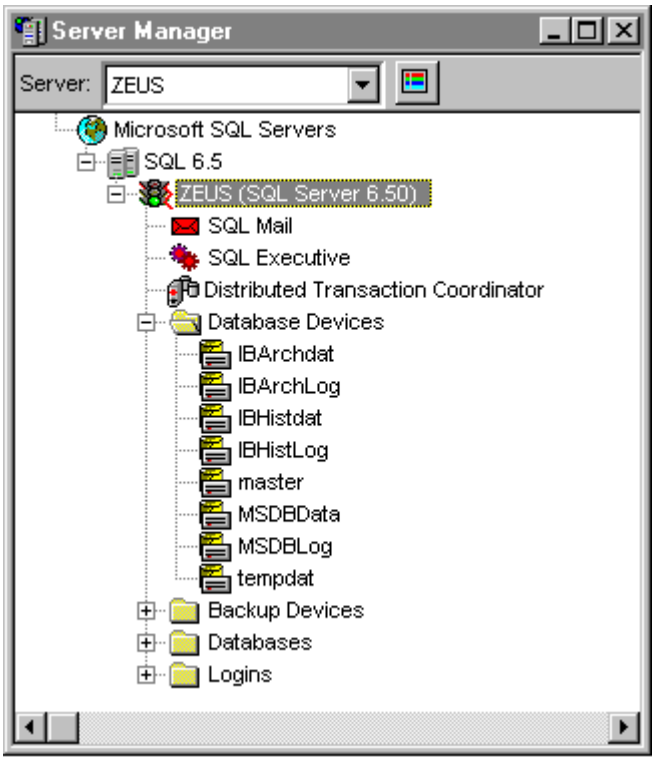
Microsoft SQL Server Setup

The following steps describe the configuration of Microsoft SQL Server. These are performed using Microsoft SQL Enterprise Manager.

Note These steps assume that a valid Microsoft SQL Server has been installed and a server has been registered.

➢ **To set up Microsoft SQL Server:**

1. In Server Manager, select the Microsoft SQL Server and then select **Database Devices**.

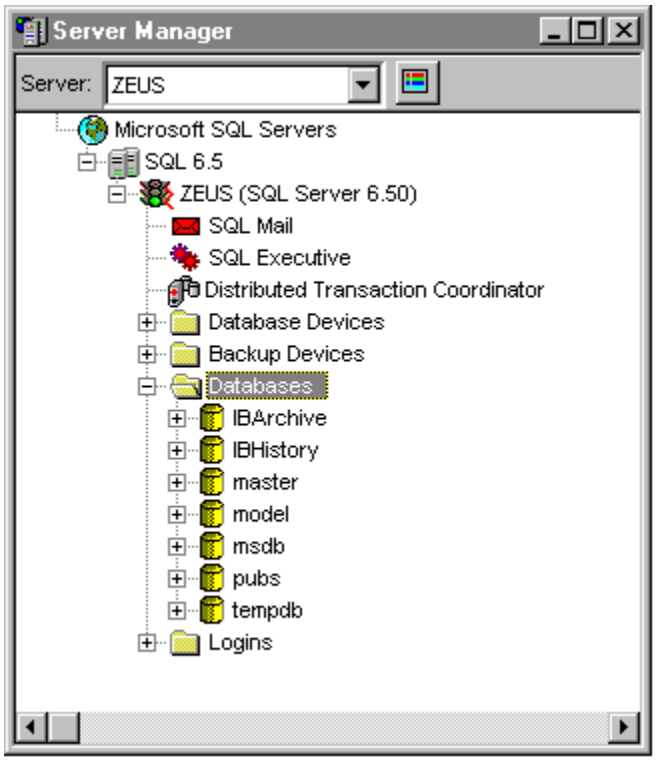


2. Add the following **Database Devices** to the registered server. These devices will be used for the InBatch history and archiving databases.

Name	Location	Size (MB)	Description
IBHistDat	IBHistDat.dat	100	History database data device
IBHistLog	IBHistLog.dat	25	History database log device
IBArchDat	IBArchDat.dat	100	Archive database data device
IBArchLog	IBArchLog.dat	25	Archive database log device

Note The sizes used will vary by the application requirements of volume and retention. The more logging an application demands, the bigger the devices.

3. Select **Databases**.



4. Add the following **Databases** to the registered server. These are the InBatch history and archive databases.

Name	Data Device	Log Device	Description
IBHistory	IBHistDat	IBHistLog	History database
IBArchive	IBArchDat	IBArchLog	Archive database

5. Select, edit, and expand the *tempdb* database. Tempdb is a SQL Server system wide temporary area shared by all databases hosted on the SQL Server. It can generally be sized as 25% of the size of the largest database on a server. For InBatch, the size is dependent on the reporting strategies implemented. Only increase the size to the maximum needed by the largest application.

Note The tempdb database does not log by definition and always uses "Truncate on Checkpoint."

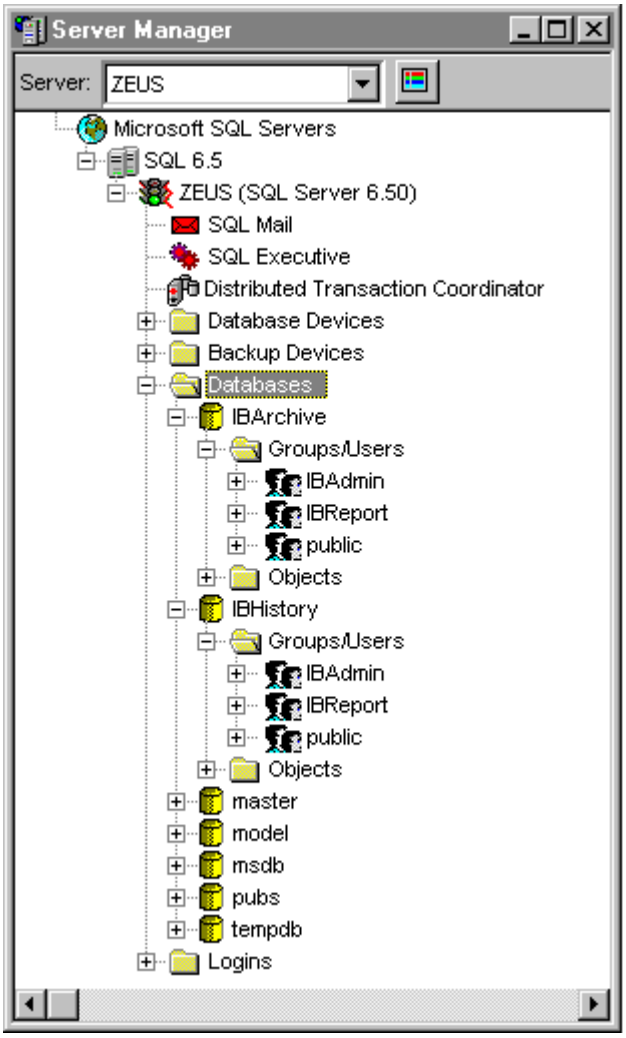
6. Open a Windows Command Prompt application, change to the InBatch HistoryDB directory. (*C:\Program Files\FactorySuite\InBatch\HistoryDB*), and execute the build database command as follows.

   builddb *SQL Server name History database Archive database*

   For example, **builddb** *ZEUS IBHistory IBArchive*

   The batch file will create all database objects and load data in the code tables.

7. Secure the database using either standard or integrated security. Security may be changed by configuring the server after the install.



There are two groups generated. IBAdmin includes the user DBO and all other administrative identifications. This group has full access and generally should have login ID aliases to DBO. IBReport includes all operators and reporting clients and has read only access to the InBatch history database tables and similar access to the tables in the archive database.

Using standard security, you must create a login ID for users that have access to InBatch reporting and users that have InBatch administrative rights. These logins must then be added to the appropriate groups described above.

Using integrated security, all appropriate users are defined in the Windows User Manager and then assigned to a local group defined with the SQL Security Manager. The appropriate InBatch reporting and administrative groups.

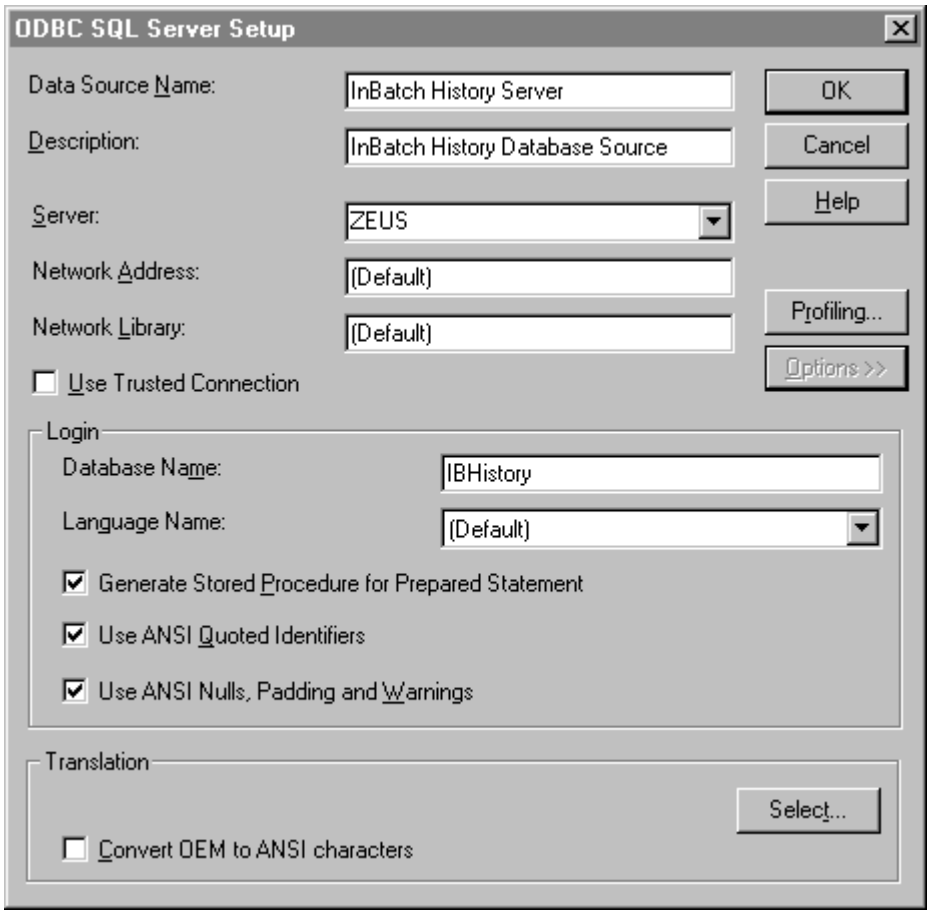
InBatch Server and InBatch Runtime Client Setup

➢ **To set up the InBatch Server and InBatch Runtime Client:**

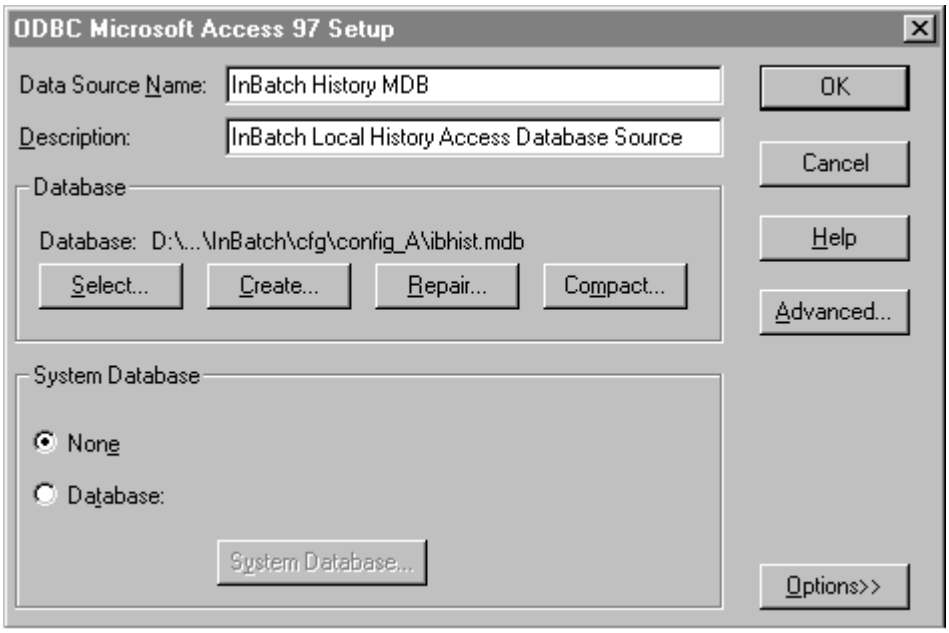
1. Select the ODBC option from the Windows Control Panel, select the **System DSN** tab, and configure the following system data source names.

Data Source Name	Driver
InBatch History Server	SQL Server
InBatch History MDB	Microsoft Access Driver (*.mdb)

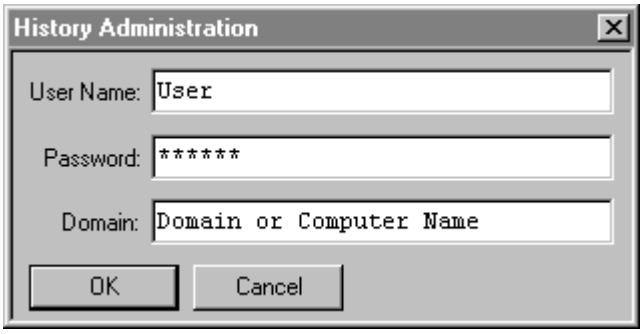
The following is an example using the SQL Server driver.



The following is an example using the Microsoft Access Driver (*.mdb)



2. Select the InBatch History Administration program from the *Start\Programs\Wonderware FactorySuite\InBatch Server* folder.
3. The **History Administration** dialog box appears.



4. Enter the **User Name**, **Password**, and **Domain** (or computer name if stand-alone) for the user under which InBatch will write information to history. Typically this is the user under which the FactorySuite common components were installed.

   ☞ For more information on the FactorySuite common installation routine, see "Common Installation Options" in this administrator's guide.

Installing InTrack

During the InTrack installation, you can choose to install the following products:

- InTrack development system, which includes the database schema for process modeling and the editors used to modify the schema and populate the database.

  Before installing the InTrack development system, you must have a relational database management system (either Microsoft SQL Server, IndustrialSQL Server, or Oracle) installed and configured.

- InTrack runtime system, which is the program used by the plant floor operator to interact with the InTrack HMI application in real-time.

- Seagate Crystal Reports Professional, which is a third-party reporting tool.

Important If you plan on using InTrack with InTouch, be sure that you install InTouch first. The InTrack installation will detect InTouch and will install the InTrack wizards and other necessary files. If you install InTrack on a computer that does not have InTouch, the InTrack files will not be installed.

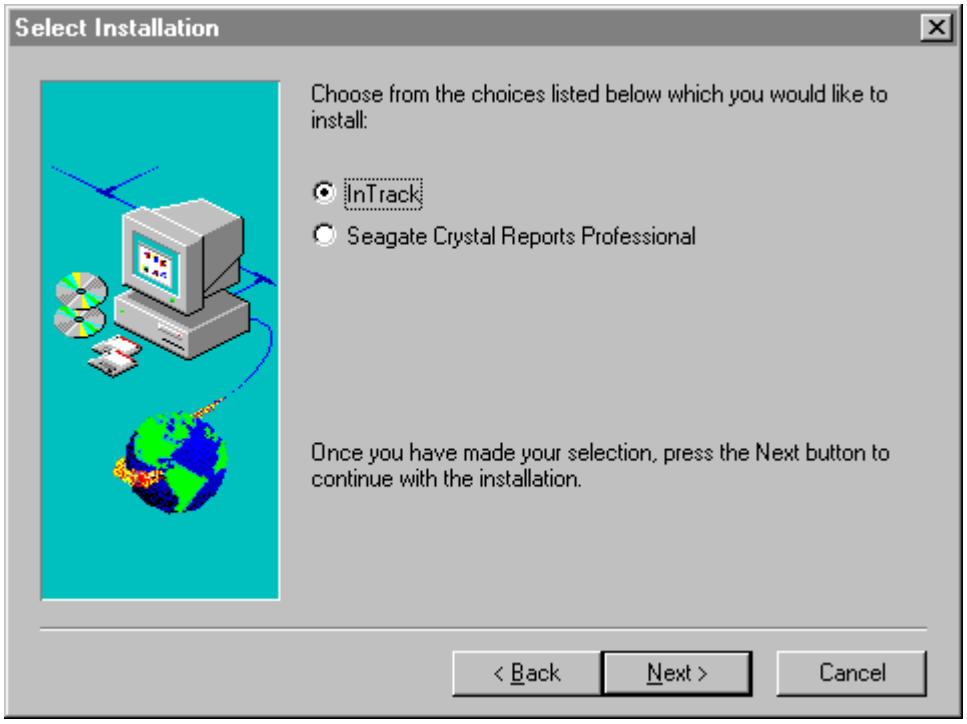
Installation

➢ **To install InTrack:**

1. If you are installing InTrack from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install InTrack, return to this section and continue with Step 2 to complete the installation.

   If you are installing InTrack using the setup program on the InTrack CD, double-click SETUP.EXE in the InTrack folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

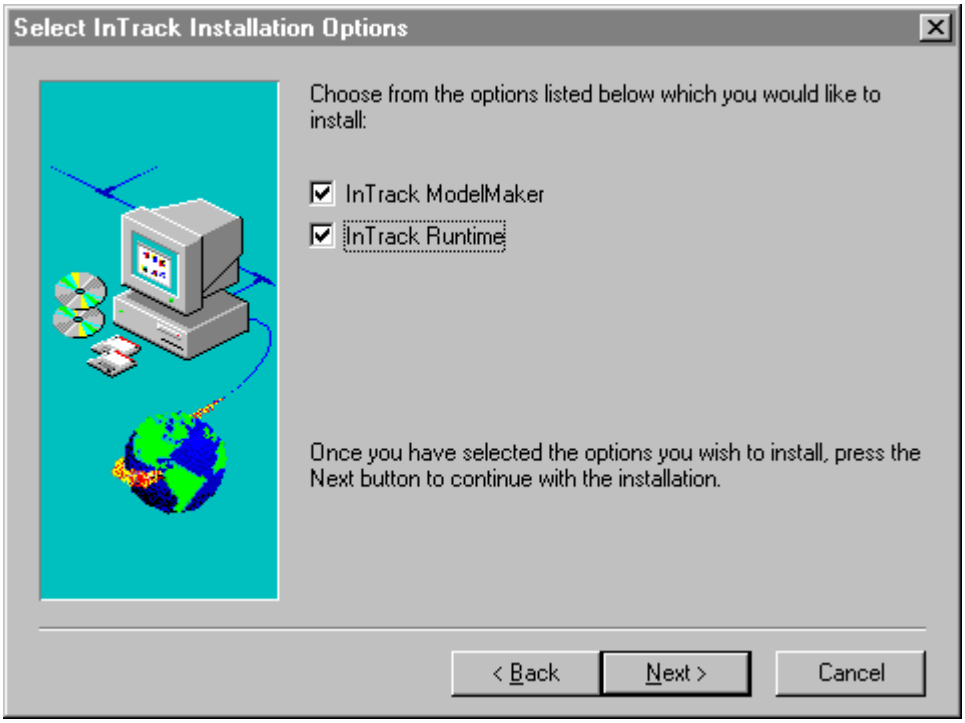
2. The **Select Installation** dialog box appears.



3. Select to install either **InTrack** or the **Seagate Crystal Reports Professional** reporting application.
4. Click **Next**.
5. If InTrack is not currently installed, the **Choose Destination Location** dialog box appears.

   ☞ For more information, see "Common Installation Options" earlier in this chapter.
6. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   The **Select InTrack Installation Options** dialog box appears.



7. Check the InTrack system that you want to install:

   InTrack ModelMaker
   Includes the database schema for process modeling and the editors used to modify the schema and populate the database.

   Note Before installing the InTrack development system, you must have a relational database management system (either Microsoft SQL Server, IndustrialSQL Server, or Oracle) installed and configured. You must also have InTouch installed.

   InTrack Runtime
   Program used by the plant floor operator to interact with the HMI application in real-time.
8. Click **Next**.

   All required common component files and InTrack program files will be copied to hard disk and your system will be configured.

   The **Installation Completed** dialog box will appear when installation is complete:
9. Click **OK**.

Upgrading

Upgrading from InTrack 3.1 to InTrack 7.0 is a multi-step process. The actual database migration process is automated, but the rest of the process must be done manually. To upgrade from InTrack 3.1 to 7.0 you must:

1. Prepare for migration.
2. Install InTrack 7.0.
3. Migrate your InTrack 3.1 database(s).

   For detailed instructions on upgrading InTrack, see your *InTrack Getting Started Guide*.

Installing I/O Servers

This section describes the basic steps involved in installing a FactorySuite I/O Server.

Installation

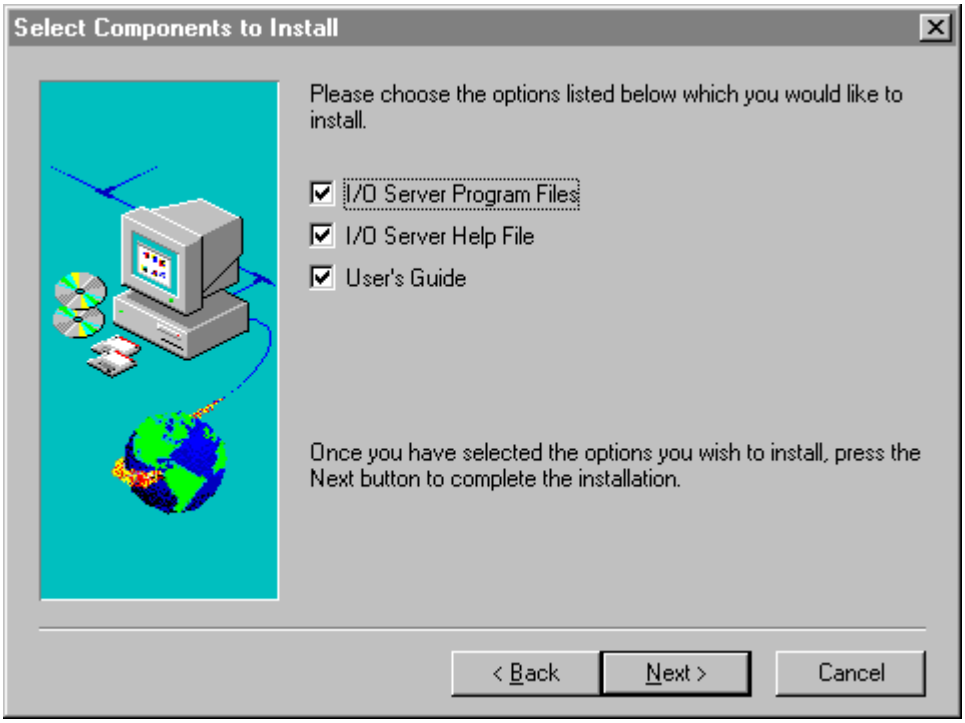
➢ **To install an I/O Server:**

1. If you are installing an I/O Server from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install an I/O Server, return to this section and continue with Step 2 to complete the installation.
2. At the start of the I/O Server installation, all required common component files will be copied to hard disk and your system will be configured.

   The **Choose Destination Location** dialog box appears.
3. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   ✍ For more information, see "Common Installation Options" earlier in this chapter.

   The **Select Components to Install** dialog box appears.



4. Check the components to install and click **Next**.

   The **Verify Setup Information** dialog box appears.

5. Check that all of the installation details are correct. To change any of the details, use the **Back** button to return to the beginning of the configuration options.

   If all of the current settings are correct, click **Next** to finish the installation. All of the I/O Server files will then be installed.

   The **Setup Complete** dialog box will appear when installation is complete:

6. Select when to restart the computer in order for the installation to take effect and then click **Finish**.

Installing Scout

During the Scout installation, you can choose to install the following products:

- Scout Outpost, which is a networked node with a running web server, data agent, and access to at least one data provider. Scout depends on standard HTTP and CGI techniques and works with any standard CGI 1.0 compliant web server. An Outpost is essentially a data transmitter for Scout VT.
- Scout VT, which is the client visualization application that enables users to view real-time data over the Internet.

Scout depends on standard HTTP and CGI techniques and works with any standard CGI 1.0 compliant web server. Scout Outpost has been tested using the Microsoft Internet Information Server®, the Netscape Enterprise Server®, and the Netscape Communications Server®. You can also use any standard browser, such as Internet Explorer, to view data from Scout Outpost.

📖 For more information, see the *Scout Online Guide* available on the Internet.

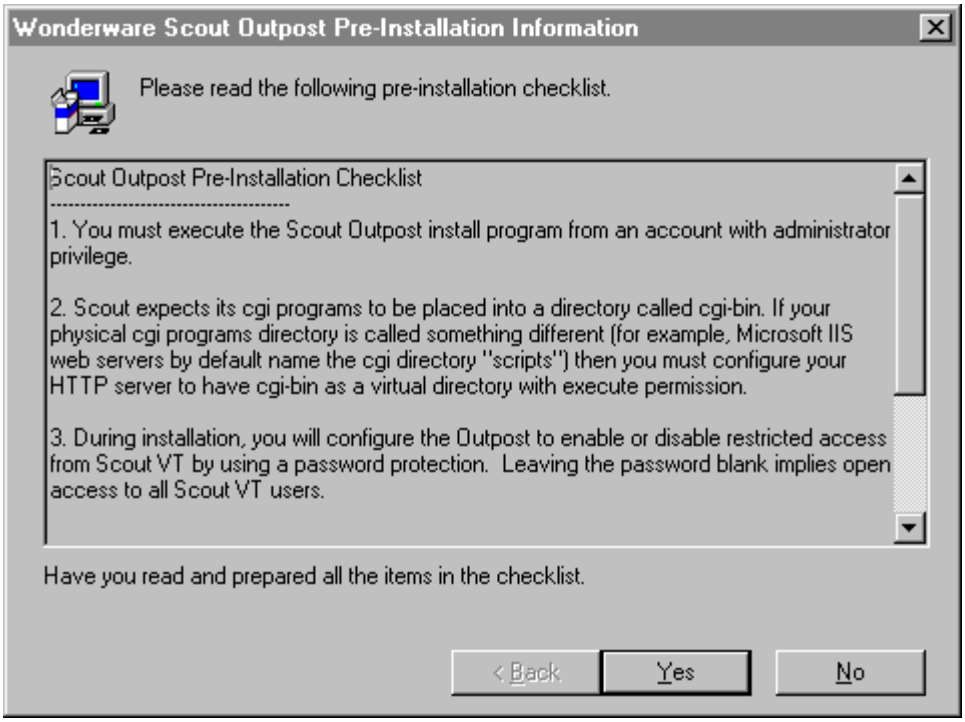
Scout Outpost Installation

➢ **To install Scout Outpost:**

1. If you are installing Scout Outpost from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install Scout Outpost, return to this section and continue with Step 2 to complete the installation.

   If you are installing Scout Outpost using the setup program on the Scout CD, double-click SETUP.EXE in the Scout Outpost folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

2. The **Wonderware Scout Outpost Pre-Installation Information** dialog box appears.



3. Click **Yes** to verify that you have completed or are aware of all the necessary configuration or **No** to exit the installation program.
4. Following the prompts to finish the installation.

   📖 For more information, see the Scout Web site at *http://scout.wonderware.com*.

Scout VT Installation

➢ **To install Scout VT:**

1. If you are installing Scout VT from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install Scout VT, return to this section and continue with Step 2 to complete the installation.

   If you are installing Scout VT using the setup program on the Scout CD, double-click SETUP.EXE in the Scout VT folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.
2. If Scout VT is not currently installed, the **Choose Destination Location** dialog box appears.
3. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   For more information, see "Common Installation Components" later in this chapter.

   All required common component files and Scout VT program files will be copied to hard disk and your system will be configured.

   The **Information** dialog box will appear when installation is complete:
4. Click **OK**.

Installing Productivity Pack

The Wonderware Productivity Pack, Productivity Pack includes WizGen™, a handy software tool that helps users to develop custom wizards. The Productivity Pack has more than 2,000 wizards that make application development easier than ever before and also includes a 16-pen trend.

➢ **To install Productivity Pack:**

1. If you are installing Productivity Pack from the FactorySuite setup program, see "Running the Master Installation Program" in this administrator's guide. After selecting to install Productivity Pack, return to this section and continue with Step 2 to complete the installation.

   If you are installing Productivity Pack using the setup program on the Productivity Pack CD, double-click SETUP.EXE in the Productivity Pack folder. You will be prompted to enter the same information that is part of the FactorySuite master installation routine. After providing the registration information, continue with Step 2 to complete the installation.

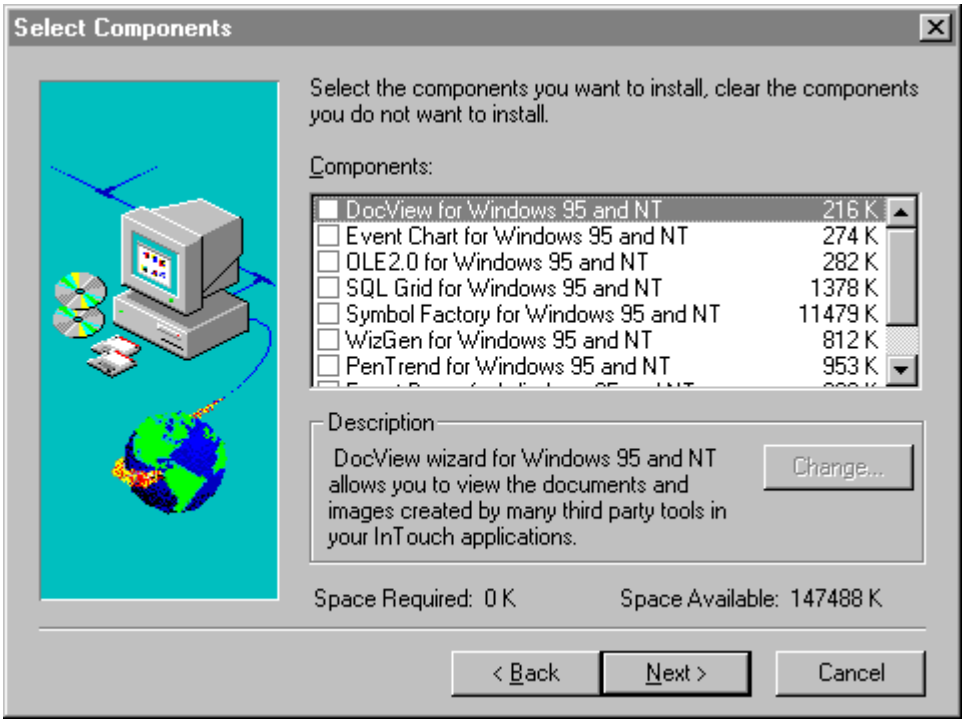
2. At the start of the Productivity Pack installation, all required common component files will be copied to hard disk and your system will be configured.

   The **Select Productivity Pack Destination Directory** dialog box appears.

3. Click **Next** to accept the default destination, or click **Browse** to use/create a different destination directory.

   ☞ For more information, see "Common Installation Options" earlier in this chapter.

   The **Select Components** dialog box appears.



4. Check the components to install and click **Next**.

   The **Start Copying Files** dialog box appears.

5. Check that all of the installation details are correct. To change any of the details, use the **Back** button to return to the beginning of the configuration options.

If all of the current settings are correct, click **Next** to finish the installation. The Productivity Pack files for the options you selected will then be installed.

The **Setup Complete** dialog box will appear when installation is complete:

6. Click **OK**.

Un-Installing a FactorySuite Component

This section provides general instructions on how to remove a FactorySuite component.

➢ **To remove a FactorySuite component:**

1. In **Control Panel**, double-click the **Add/Remove Programs** icon.
2. In the **Add/Remove Program Properties** dialog box, select the component from the list.
3. Click **Add/Remove**.

   The un-install dialog box for that component appears.
4. Click **Yes** to continue the un-install, or click **No** to cancel.
5. Follow the prompts to remove component.
6. When the un-install has successfully been completed, click **OK** to exit the un-install program.

CHAPTER 4

Component Networking Options

This chapter explains some of the networking options that are available for each of the FactorySuite components. This chapter also describes which FactorySuite components run as Windows NT services and how to configure ODBC connections.

For details on installing components of the FactorySuite, see Chapter 3, "Installation."

The Wonderware FactorySuite uses the following network protocols to exchange data on the network: DDE, FastDDE, NetDDE, SuiteLink, and OPC.

InTrack also uses TCP/IP, Named Pipes, IPX/SPX or TNS Services to communicate with the RDBMS server.

For details on network protocols, see Chapter 5, "Protocols."

Contents

Server Components

In the FactorySuite, a server component is an application that functions primarily to process requests for data from other applications (clients). All of the data storage and/or retrieval occurs on the server application. The following Wonderware FactorySuite components are servers:

- IndustrialSQL Server
- InBatch Server
- Scout Outpost
- I/O Servers
- InControl

Note InControl can replace both I/O Servers and PLCs.

Client Components

In the FactorySuite, a client component is an application that accesses data from a server. A client application functions to present the data to the user in a meaningful context, by displaying it, graphing it, plotting it, using it for animations, and so on, or to provide a means for configuring how the data will be retrieved, processed, or stored on the server. The following Wonderware FactorySuite components are clients:

- InTouch (Development and Runtime)
- InTrack (Development and Runtime)
- IndustrialSQL QuickLook
- IndustrialSQL Trend and ActiveTrend
- IndustrialSQL ActiveEvent
- IndustrialSQL VectorMaster and VectorViewer
- IndustrialSQL Configure
- InBatch Development Client
- InBatch Runtime Client
- Scout VT

Note InControl can be configured to function as a client. For more information, see your *InControl User's Guide*.

I/O Servers

An I/O Server is an application that allows other Windows application programs to access data within factory floor devices, such as PLCs and RTUs. Generally, an I/O Server communicates with a factory device through the serial port of the computer on which the I/O Server application is installed. However, some PLCs exist as boards or cards that are installed in the I/O Server computer.

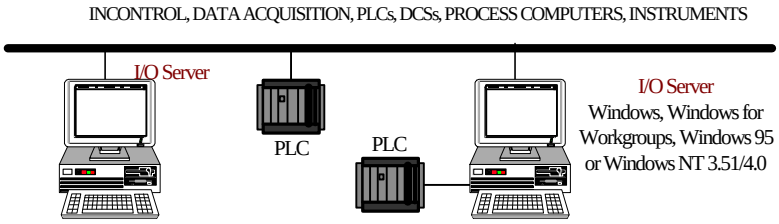
You can install I/O Servers on the same computer as any other FactorySuite component.

➢ **To configure an I/O Server:**

1. Install the I/O Server application on any computer running either the Windows 3.1, Windows for Workgroups, Windows 95, or Windows NT 3.51/4.0 operating system.
2. If the I/O Server is using DDE, set up a share for any other FactorySuite component that needs access to the information. For example, if you have a node running GE Genius I/O Server, you need to create a share for that I/O Server.

For more information on configuring DDE shares, see Chapter 5, "Protocols."

The following diagram shows an I/O Server system.



Note InControl can replace both I/O Servers and PLCs.

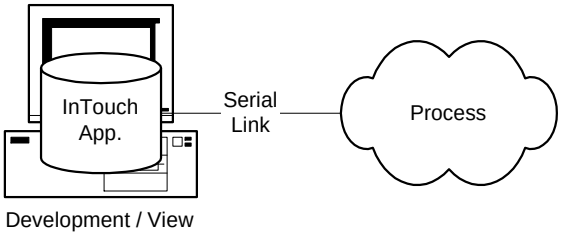
InTouch

InTouch is designed to support both stand-alone and distributed applications. Stand-alone applications are those that use just one Operator Interface (OI) for each monitored system, such as in a boiler package control. Stand-alone applications are generally easier to configure, with minimal to no networking, and require only simple maintenance. Distributed applications, conversely, are much more complex, often with several layers of networks. Distributed applications, typically, have a central development station, central data storage, with many *client* stations that interact with the central station and each other.

📖 This section provides an overview of how to set up an InTouch system. For detailed information, see your *InTouch User's Guide*.

Stand-alone Application

Stand-alone applications are defined as those with a single operator interface for each monitored process. These typically consist of one non-networked personal computer (PC) that functions as the primary operator interface (OI). This computer is connected to the industrial process via a direct connection, such as a serial cable.



In this architecture, a single InTouch application is installed on the computer. If development work is required, the application can be developed directly on this computer. It can also be copied to another computer, modified, and then copied back to the original computer.

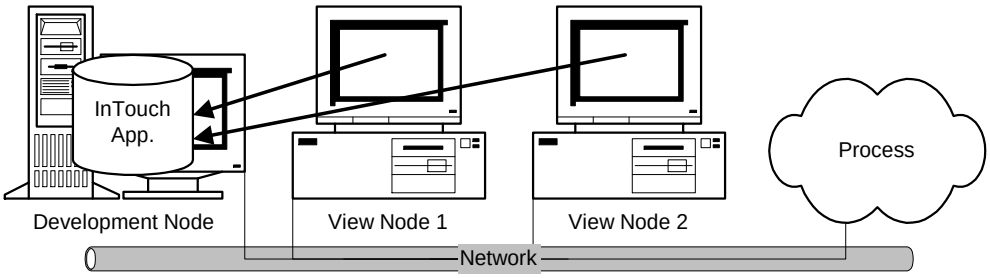
➢ **To configure a stand-alone system:**

1. Install an InTouch development system (which also includes the runtime system) on a client-type computer running the Windows NT operating system.
2. If you are using DDE, set up a share for any node containing I/O resources that InTouch may need to access. For example, if you have a node running GE Genius I/O Server, you need to create a share for that I/O Server.

   For more information on configuring DDE shares, see Chapter 5, "Protocols."

Server-Based Architecture

The server-based architecture allows several View nodes to share a common InTouch application. In the example below, the two View nodes are accessing the same application from the development node. Each View node must create a logical drive in the networking software and map it to the shared network drive of the development node. Each View node must also have the shared application registered with the InTouch program.



As in the client-based architecture, each View node must have identical access to any data sources referred to by the application. There are also ways to tailor the data source locations by using a combination of scripts to get the node name and change each data source location based on that name.

➢ **To configure a server-based system:**

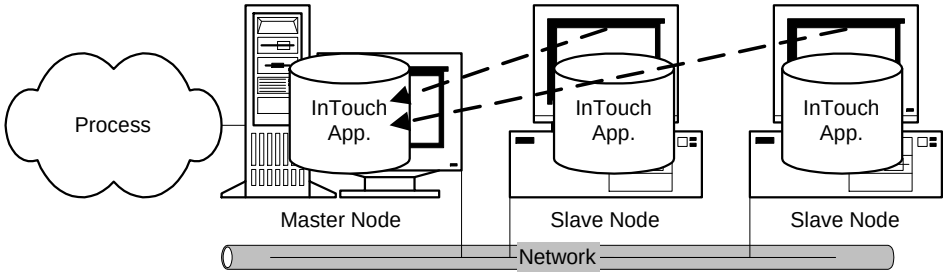
1. Install an InTouch development system (which also includes the runtime system) on a client-type computer running the Windows NT operating system.
2. Install an InTouch runtime system on one or more client-type computer running the Windows NT or Windows 95 operating systems.
3. If you are using the Windows NT operating system and are using DDE, you will need to set up a DDE share for any node containing I/O resources that other View nodes may need to access. For example, if you have a node running GE Genius I/O Server, you need to create a share for that I/O Server.

For more information on configuring DDE shares, see Chapter 5, "Protocols."

Master/Slave Architecture

The master/slave architecture was developed to overcome some of the drawbacks of the client-based and server-based architectures. While it still allows View nodes to be set up in a client or server type architecture, it does not require that they all have the same data sources.

The architecture defines one node as a "Master" node (usually the computer connected to the industrial process). This node acts as a server to the remote or "Slave" View nodes running the same application. In the example below, each "Slave" node can either run its own unique copy of the application or a common application. Either way, once running, each "Slave" node references all its I/O data sources via the "Master" node that is connected to the monitored process.



➢ **To configure a master/slave system:**

1. Install an InTouch development system (which also includes the runtime system) on a client-type computer running the Windows NT operating system.
2. Install an InTouch runtime system on one or more client-type computers running the Windows NT or Windows 95 operating systems.
3. If you are using the Windows NT operating system and are using DDE, you will need to set up a DDE share for any node containing I/O resources that other View nodes may need to access. For example, if you have a node running GE Genius I/O Server, you need to create a share for that I/O Server.

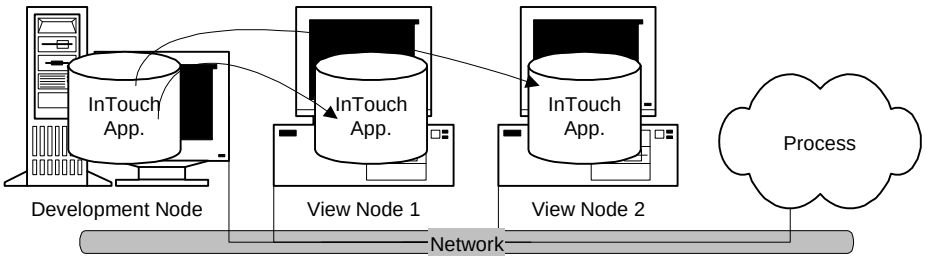
   For more information on configuring DDE shares, see Chapter 5, "Protocols."
4. Configure a single InTouch development or runtime computer to act as the master node for the other InTouch nodes.

Network Application Development (NAD)

Network Application Development or NAD is an architecture that combines the best of the client-based and server-based architectures. NAD provides automatic notification of application changes and automatic distribution of the updated applications to View nodes. NAD can even be used to automatically distribute master/slave applications.

Note You cannot use the NAD features if you are using WindowViewer as an NT service. An application must be developed and tested on the development node, and then copied to each View node.

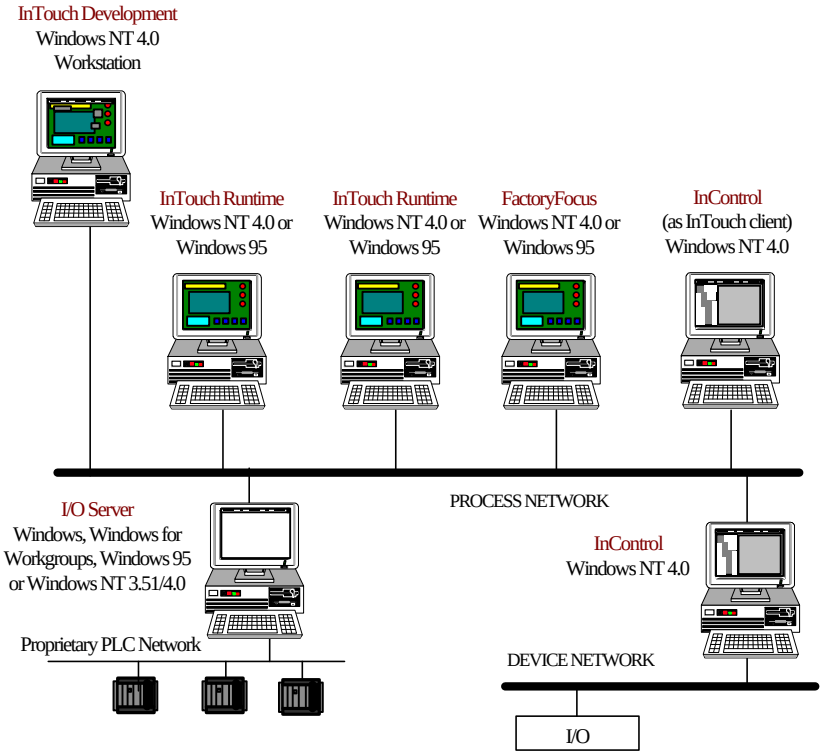
In the NAD architecture, a master copy of an application is maintained on a central network location. Each View node loads that network application as they would in a server-based architecture but, instead of running the application from the server, the application is copied to and run from a user-defined location. This provides the client-based advantage of redundancy. In the example below, the two View nodes both have the master application registered from the development node, but actually run it from their own hard drives.



When a View node copies and runs a master application, it automatically monitors the master copy for any changes.

InTouch System Diagram

The following diagram shows a fully distributed InTouch system.



Note InControl can replace both I/O Servers and PLCs.

InControl

InControl is a real-time open architecture control system that allows you to design, create, test and run application programs for controlling plant process. InControl is both a PLC (able to be programmed using a number of IEC languages like RLL and able to directly drive factory data) and an I/O Server (able to connect with InTouch and other clients interested in obtaining factory data). Because InControl is a "soft" PLC, it has many advantages over the traditional proprietary PLC, including ease of connectivity and versatility.

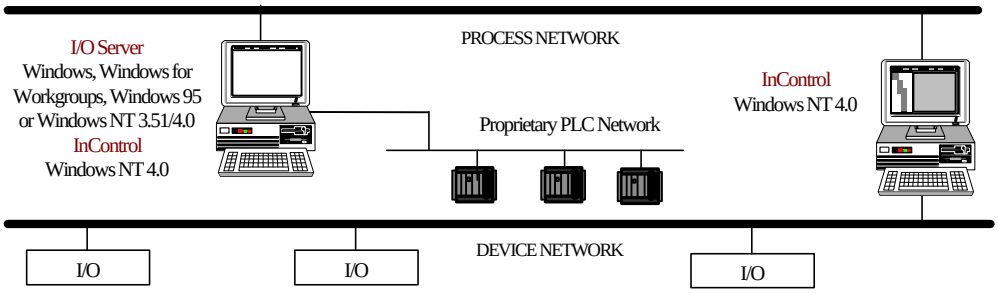
To configure InControl, install InControl on a client-type computer running the Windows NT operating system.

InControl has a special interface as part of the Runtime Engine (RTE) which allows it to participate in DDE, Fast DDE, and SuiteLink communications as a data server to applications such as InBatch or IndustrialSQL Server. Using a special I/O Driver, InControl can also act as client in these communications.

📖 For more information on setting up InControl as a client, see your *Wonderware InControl SuiteLink User's Guide*.

InControl System Diagram

The following diagram shows an InControl system.



InControl can control any PLC or I/O Server using SuiteLink, FastDDE, or DDE. InControl does not have to be used in parallel with existing PLC hardware, but can also be used to control it.

IndustrialSQL Server

IndustrialSQL Server is a highly configurable package that can be set up in many different ways, depending on your needs. This section provides an overview of the various architectures available with IndustrialSQL Server and the recommended configurations for each. Generally, it is recommended that you split the process and IS networks to ensure that the process network does not become overloaded.

Note All tags to be stored in IndustrialSQL Server are on "advise" all of the time. This may cause heavy load conditions on the process network. Prior to installing IndustrialSQL Server, you should investigate the possible load impact of installing IndustrialSQL Server on your network.

➢ **To configure an IndustrialSQL Server system.**

1. Install two network adapter cards on a server-type computer running the Windows NT operating system. Configure them to segment the IS network from the process network.
2. Install IndustrialSQL Server on the server computer.

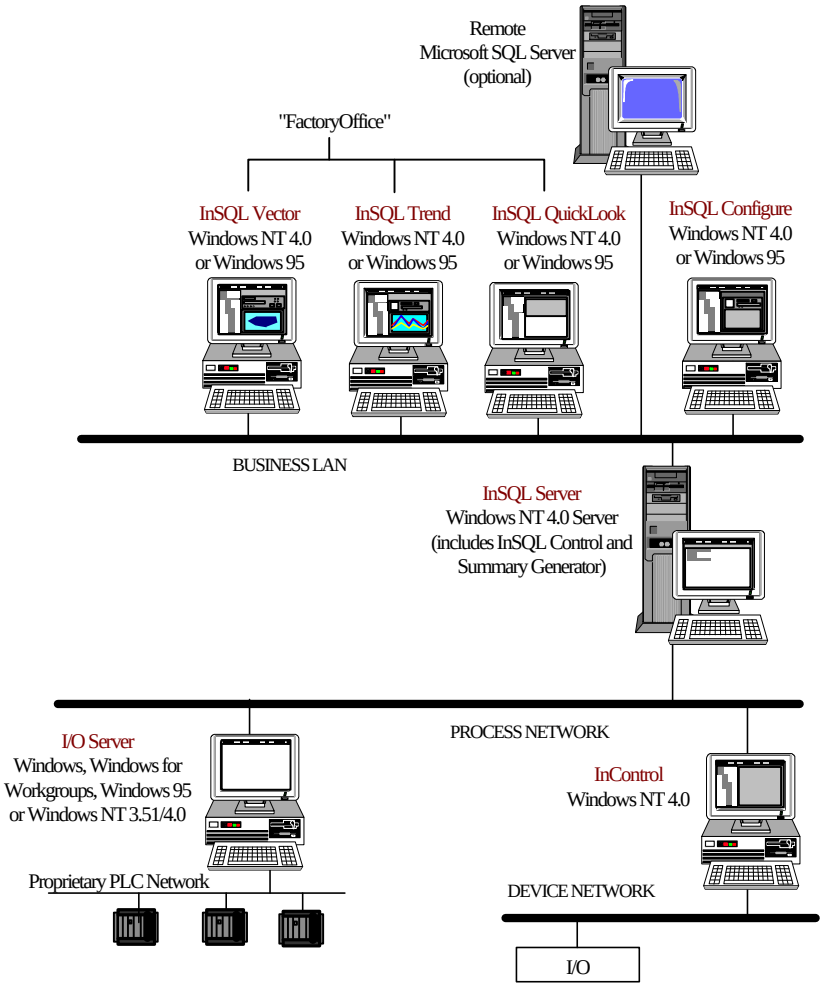
   The IndustrialSQL Server must have access to a Microsoft SQL Server. During the IndustrialSQL Server installation, you can either choose an existing local or remote Microsoft SQL Server, or have the installation program install a copy for you.
3. Install any I/O Servers.
4. If you are using DDE, set up shares for each remote I/O Server used with IndustrialSQL Server.

   For more information on creating DDE shares, see Chapter 5, "Protocols."
5. Install the IndustrialSQL clients on one or more client-type computers running either the Windows NT or Windows 95 operating system. A computer running IndustrialSQL clients can reside on the business LAN.

Note If you are going to import data from an existing InTouch application to configure the IndustrialSQL Server, set up any remote DDE shares before you perform the import.

IndustrialSQL Server System Diagram

The following diagram shows a fully distributed IndustrialSQL Server system.



Note InControl can replace both I/O Servers and PLCs.

InBatch

InBatch is scaleable batch management software designed to model and automate batch-oriented production processes. InBatch consists of three main components: the InBatch Server, the InBatch Development Client and the InBatch Runtime Client. The InBatch Development Client is made up of a set of batch editors that are used to create a model of the batch production process. The InBatch Server is a database that reflects the batch model and stores and manages all batch-related data. The InBatch Runtime Client is a runtime application the enables a plant floor operator to run the batch process and collect data.

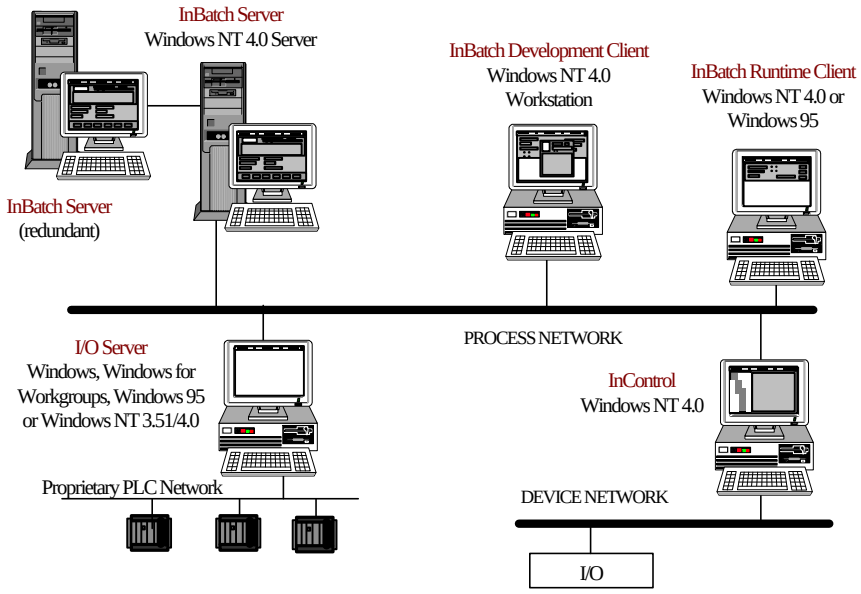
➢ **To configure an InBatch system:**

1. Install the InBatch Server on a server-type computer running the Windows NT operating system.
2. Install any I/O Servers.
3. If you are using DDE, set up shares for each remote I/O Server used with InBatch.

   For more information on creating DDE shares, see Chapter 5, "Protocols."
4. Install the InBatch Development Client on the same computer as the InBatch Server or on a different, client-type computer.
5. Install the InBatch Runtime Client on one or more client-type computers running the Windows NT operating system.

InBatch System Diagram

The following diagram shows a fully distributed InBatch system.



Note InControl can replace both I/O Servers and PLCs.

InTrack

InTrack is a graphical application development tool for building client/server applications to monitor, manage and improve production operations. InTrack consists of three main components: a configured Microsoft SQL Server or Oracle server, the InTrack Development environment, and the InTrack runtime environment. The InTrack development environment is made up of a set of production editors that are used to create a model of the production process. The InTrack development environment also incorporates InTouch WindowMaker for creating the runtime graphical user-interface.

The Microsoft SQL Server or Oracle server is a database that reflects the production model and stores and manages all production-related data. The InTrack runtime environment is an InTouch WindowViewer or Visual Basic application that enables a plant floor operator to run the production process and collect data.

➢ **To configure an InTrack system:**

1. Install and configure Microsoft SQL Server on a server-type computer running the Windows NT operating system or Oracle on a server-type computer running one of the operating systems supported by Oracle.

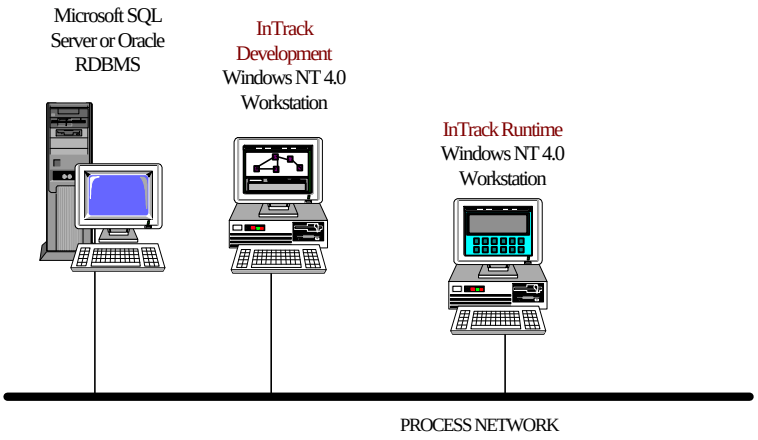
   Note You can use IndustrialSQL Server in place of a normal Microsoft SQL Server.

2. Install the InTrack Development and Runtime environments on either the same computer as the Microsoft SQL Server or Oracle Server (if it is running on Windows NT), or on a separate client-type computer running the Windows NT operating system.

3. Install InTrack Runtime on one or more client-type computers running the Windows NT operating system.

InTrack System Diagram

The following diagram shows an InTrack system.



Scout

Scout is a visualization tool for viewing real-time data over the Internet. The Scout product line has been optimized for exposing data from Wonderware's Factory Suite but can be used to visualize data from virtually any live data source. The Scout product consists of two principle components: Scout Outpost (the server) and Scout VT (the client).

Scout Outpost is a networked node with a running web server, data agent and access to at least one data provider. Scout depends on standard HTTP and CGI techniques and works with any standard CGI 1.0 compliant web server. An Outpost is essentially a data transmitter for Scout VT.

Scout VT is the client visualization application that enables users to view real-time data over the Internet. Scout VT simply uses the web server as a channel to communicate with data agents on the Scout Outpost in a way that shields the user from the details of the actual data collection chain.

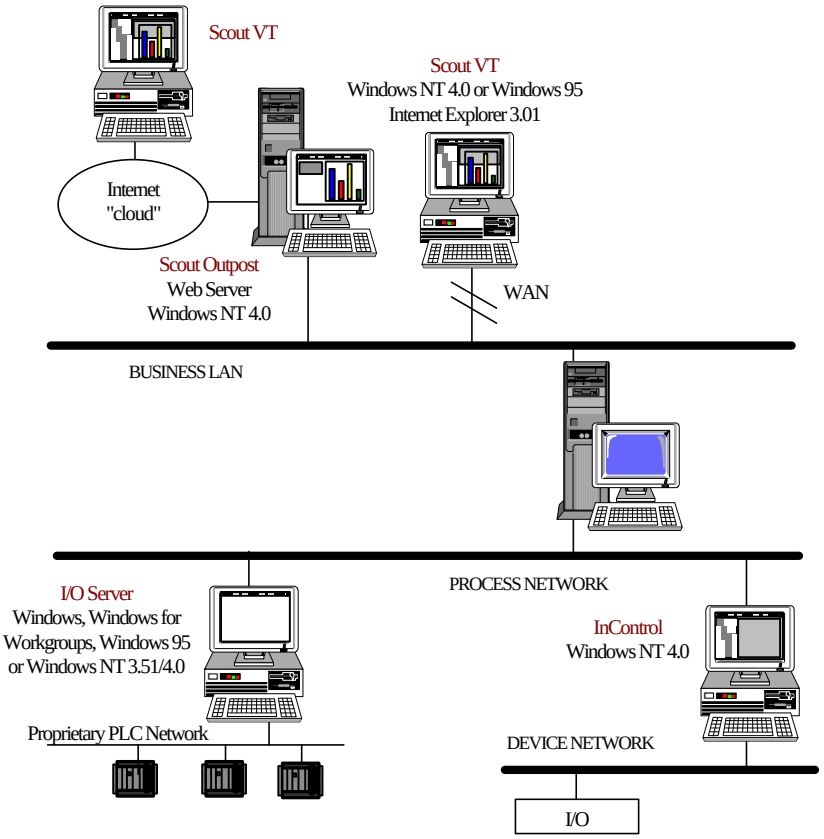
➢ **To configure a Scout system:**

1. Install and configure a web server on a server-type computer running the Windows NT operating system.
2. Install Scout Outpost on the same computer as the web server.
3. To use Scout Outpost built-in InterNetDDE features you will need to set up NetDDE shares. If you will be accessing NT based NetDDE data providers you will also be requested to supply the name and password for a user allowed access to the NetDDE data. This account is called an "Impersonation Account" and is required due to NT's secure nature and the corresponding need for data access verification. Impersonation accounts differ slightly depending upon your network configuration.

   📖 For more information on creating shares, see your *Scout Online Guide*.
4. Install Scout VT on one or more client-type computers running the Windows NT or Windows 95 operating system and Microsoft Internet Explorer 3.01 or greater.

Scout System Diagram

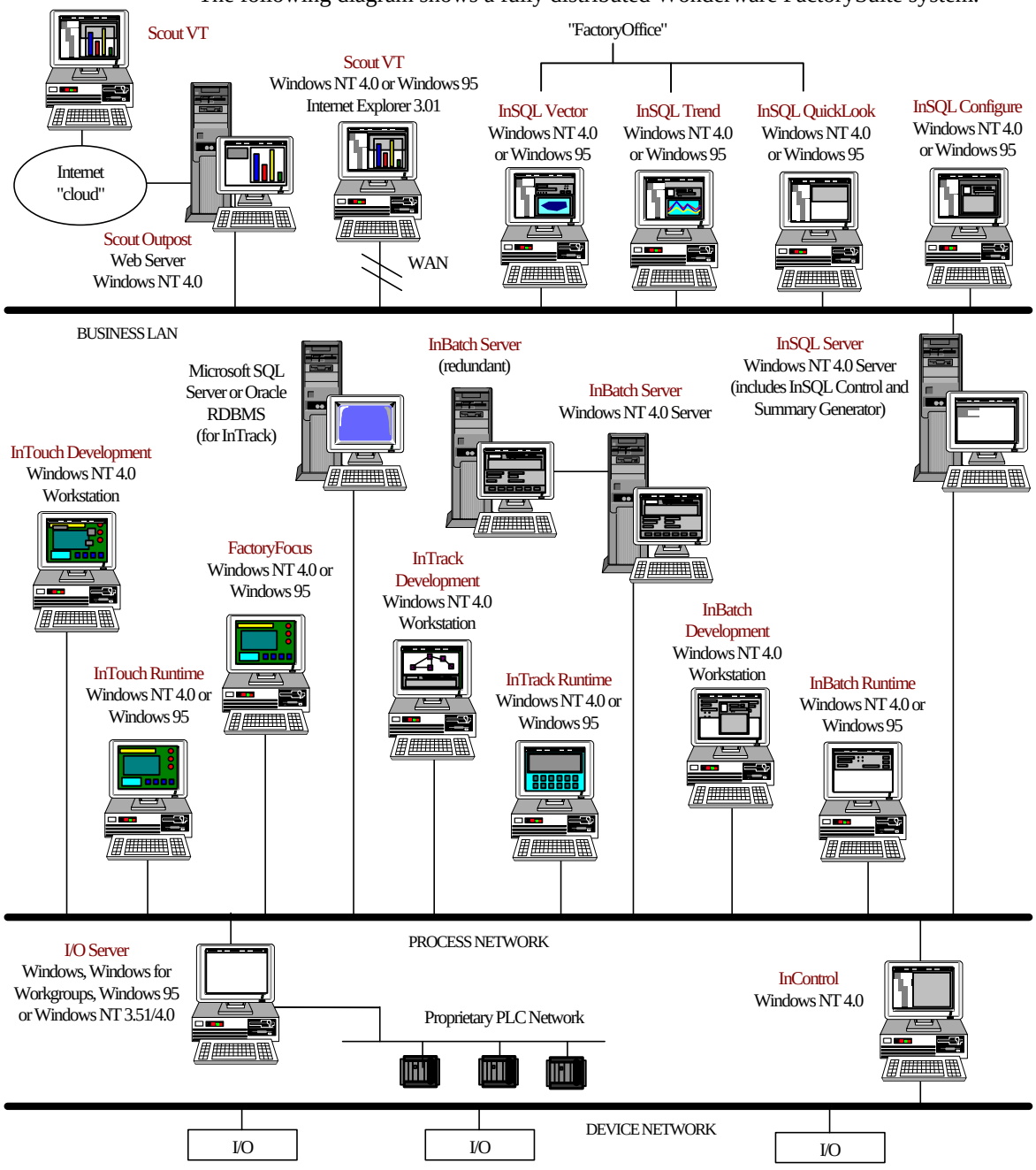
The following diagram shows a fully distributed Scout system.



Note InControl can replace both I/O Servers and PLCs.

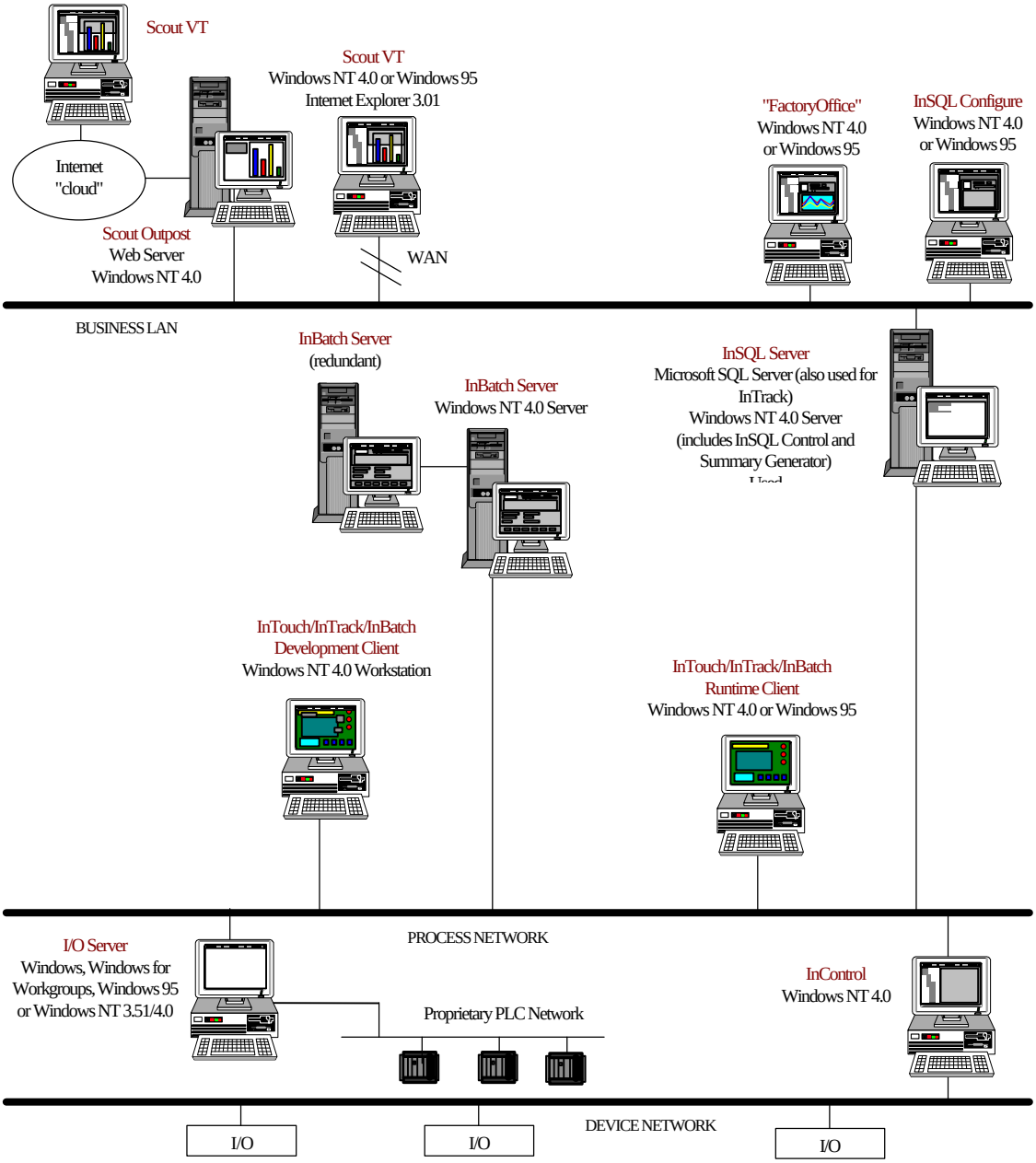
Sample FactorySuite Configurations

The following diagram shows a fully distributed Wonderware FactorySuite system.



I/O Servers can be installed on any computer on the network.

The following diagram shows a less distributed Wonderware FactorySuite system.



I/O Servers can be installed on any computer on the network.

Running Components as NT Services

A service is a process in Windows NT that performs a specific system function. Services can be configured to automatically start up when the computer on which the component is installed starts up. All services run in the "background"; no visible signs of them running appear on the desktop. This eliminates the need for a user to log on to the computer and start the application. Also, a service continues to run as different users log on and off of the computer.

Since services run independently of who is currently logged on, they are useful when implementing security measures for applications. For example, perhaps you want an operator to simply turn on the computer and have an InTouch application immediately start up in WindowViewer, without any means for running any other program. You would run WindowViewer as a service that automatically starts up at boot time, and then restrict that user's profile to only allow use of the InTouch application.

📖 For more information on Windows NT services and profiles, see your Microsoft documentation.

If you are using Windows NT, FactorySuite components are configured to run as services in one the following ways:

- The installation program will install and configure the component to automatically run as a service.
- During installation, you will be given the choice of whether or not to run the FactorySuite component as a service.
- During configuration, such as for I/O Servers, you specify whether or not to run the component as a service.

Note InTrack does not install any services.

The following table describes the FactorySuite component services.

Common		
Wonderware Logger	WWLOGSVC.EXE	Manages messages and sends them to the viewer application.
Wonderware NetDDE Helper	WWNETDDE.EXE	Aids in the administration of DDE, such as maintaining DDE connectivity as users log on and off.
Wonderware SuiteLink	SLSSVC.EXE	SuiteLink protocol.
InTouch		
Wonderware WindowViewer	VIEW.EXE	InTouch runtime environment.
IndustrialSQL Server		
InSQL Control	INSQLCNTL.EXE	Program used to start and stop the system.
InSQL DbServer	PDSSRV.EXE	Retrieval server for client applications.
InSQL Event System	EVENTSYS.EXE	Detects events and executes associated actions.

InSQL IODriver	IODRIVER.EXE	Allows data to be sent from the data devices (I/O Servers) to the acquisition system.
InControl		
InControl Runtime Engine	RTENGINE.EXE	Runtime environment.
Scout		
RpcDde	RPCDDE.EXE	DDE gateway for Scout Outpost
InBatch		
IBSERV	IBSERV.EXE	InBatch Server.
IBFSERV	IBFSERV.EXE	InBatch Function Server
InBatch_EnvMngr	ENVMNGR.EXE	InBatch Environment Manager
IBCli*	IBCLI.EXE	InBatch Client.
TIMBatch*	TIMBATCH.EXE	InBatch Tag Interface Manager
TIMFunc*	TIMFUNC.EXE	InBatch Tag Interface Function Manager
TIMSec*	TIMSEC.EXE	InBatch Tag Interface Security Manager
InBatch_UnilinkMngr*	UNILINKMNGR.EXE	InBatch Unilink Manager
InBatch_MemTagMngr*	MEMTAGMNGR.EXE	InBatch Memory Tag Manager
InBatch_SimMngr*	SIMMNGR.EXE	InBatch Simulation Manager
InBatch_InfoMngr*	INFOMNGR.EXE	InBatch Info Manager
InBatch_BatchMngr*	BATCHMNGR.EXE	InBatch Batch Processing Manager
InBatch_ReportMngr*	REPORTMNGR.EXE	InBatch Report Manager
InBatch_LogMngr*	LOGMNGR.EXE	InBatch Message Log Manager
I/O Servers		
*I/OServerName*_IOServer	Executable name for the I/O Server.	Any of the FactorySuite 2000 I/O Servers can be run as a service.

*Created/installed dynamically when the application is started.

For more information on any of the services other than common services, see your user manual for that FactorySuite component.

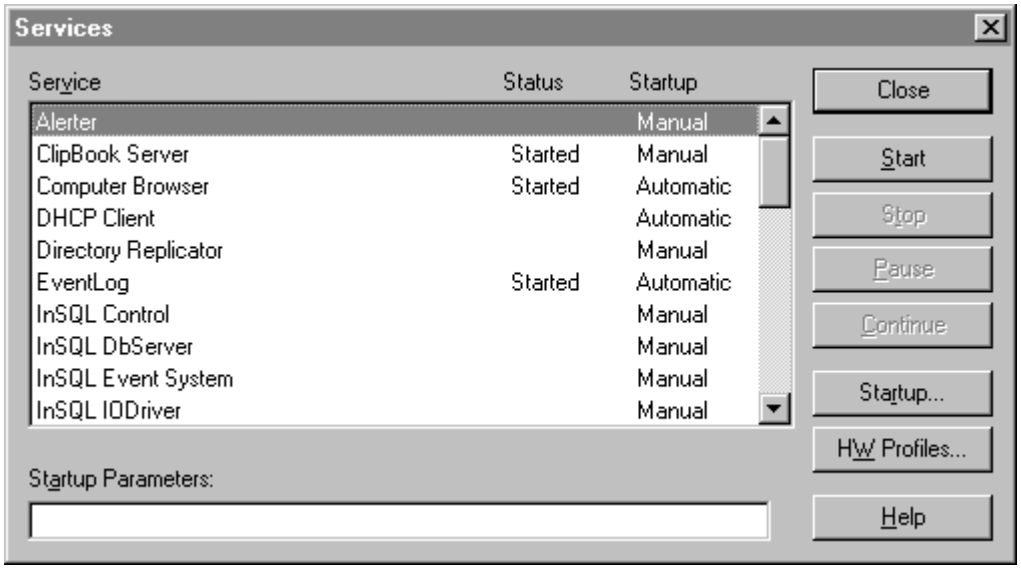
Configuring Service Details

After a service is installed, it can be configured from the **Services** program located in the **Control Panel**. You can manually start, stop, and pause services from the **Service** program, or configure startup options for the service.

➢ **To view service details:**

1. In **Control Panel**, click the **Services** icon.

   The **Services** dialog box appears.



2. The status of each service appears in the **Status** column. From this dialog box, you can start, stop, pause, or continue a selected service.
3. To view startup options for each service, click **Startup**.
4. To enable and disable services when you boot the system using specific hardware profiles, click **HW Profiles**.

For more information on services, see your Microsoft documentation.

Configuring ODBC

The Microsoft ODBC API provides a universal data access interface to a variety of client/server and mainframe databases. An application written for the ODBC API can be used to access any database management system, given the appropriate ODBC drivers. To use ODBC, three components are involved: the ODBC client, the ODBC database application, and the ODBC driver.

An ODBC client is a desktop application that writes and/or retrieves information from a database. Examples are InTouch, IndustrialSQL Server clients, and InBatch clients.

An ODBC Database Management System (DBMS) is the application that resides on a computer used to store data for access by several users. Examples are Microsoft SQL Server, Oracle, Microsoft Access, InBatch Server, or IndustrialSQL Server. or any DBMS for which an ODBC driver exists.

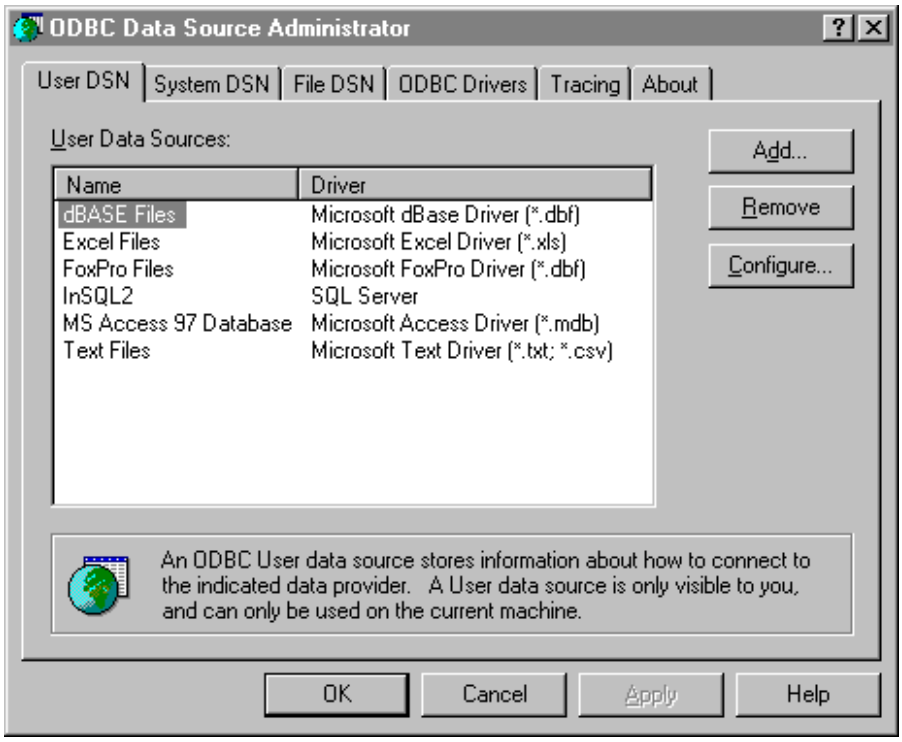
The ODBC driver facilitates communications between the ODBC client and the ODBC database application and is loaded on the ODBC client computer. Any ODBC client can access any DBMS for which there is an ODBC driver.

The following FactorySuite components use ODBC to transfer database information across the network between client and server applications: IndustrialSQL Server and clients and InBatch Server and clients.

Note No ODBC configuration is required to run InTrack against the supported Microsoft SQL Server and Oracle databases. However, if you are using InTrack with SQL Access for InTouch, you will have to configure an ODBC connection, since InTouch requires an ODBC connection to connect to the database.

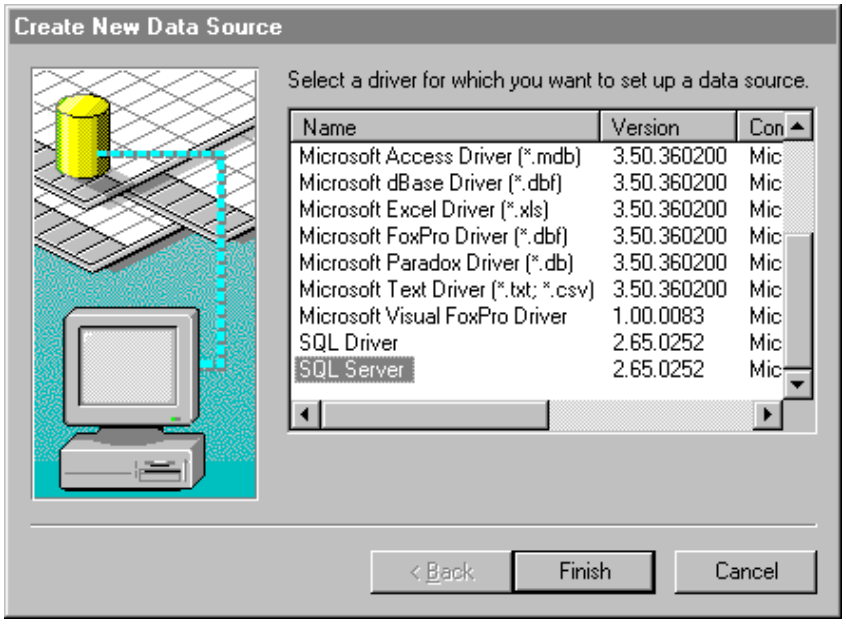
➢ **To start the ODBC utility:**

1. In **Control Panel**, double-click on the ODBC icon to run the utility (ODBCAD32.EXE).
2. The **ODBC Data Source Administrator** dialog box appears.



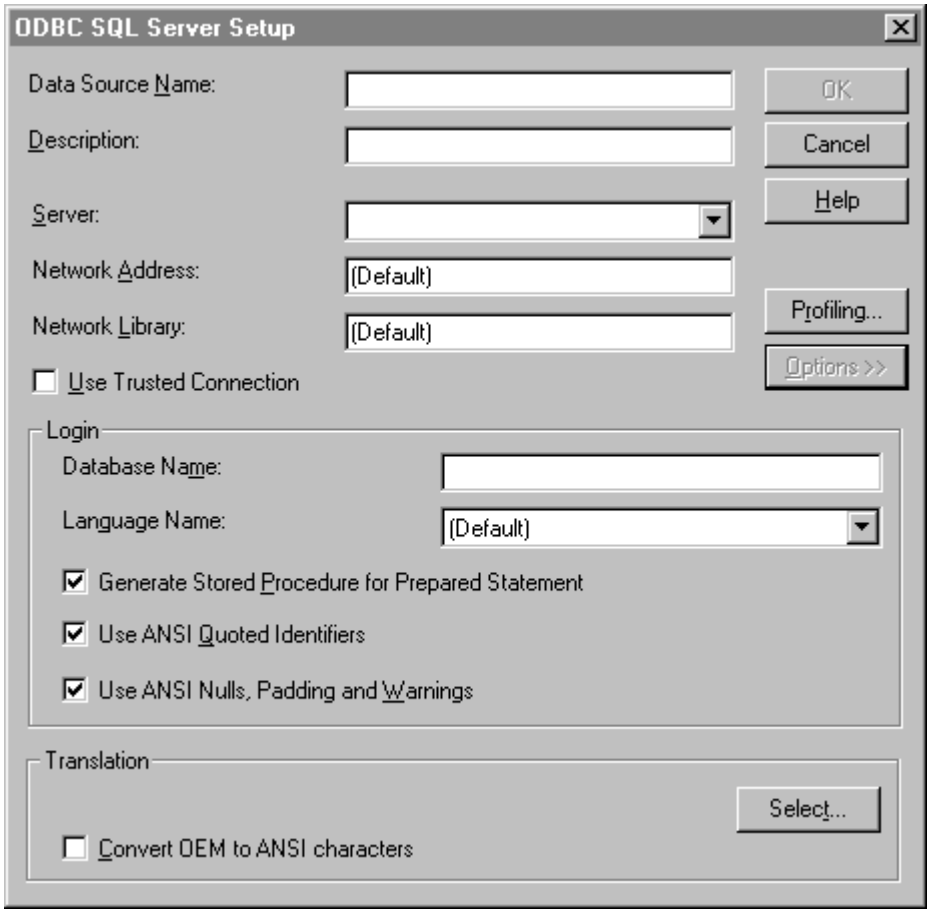
3. Click **Add**.

The **Create New Data Source** dialog box appears.



4. Select a data source driver and click **Finish**.

   The **ODBC SQL Server Setup** dialog box appears.



5. See the appropriate section for the FactorySuite component for which you want to configure ODBC.

Configuring ODBC for IndustrialSQL Server

You can establish client-to-server ODBC connections only for IndustrialSQL Servers configured using the 32-bit DB-Library. ODBC client applications use the same default Net-Library and Advanced client options as does DB-Library, unless you override these settings when you set up the data source.

Note ODBC is installed as part of the FactorySuite common component installation. At this time, the system DSN "InSQL" is created using the SQL Driver and is pointing to the IndustrialSQL client.

When setting up ODBC for IndustrialSQL Server, configure the ODBC options as follows:

Data Source Name

Connection name that the client will specify to access the IndustrialSQL Server. For example, "InSQL8."

The ODBC data source name for the IndustrialSQL Server does not have to be the same as the name given during the DB-Library configuration.

Note If the IndustrialSQL Server was configured to use SERVNAME as the server name and the named-pipe Net-Library DBNMPNTW as the default Net-Library during the client Net-Library configuration, you only need to specify the data source name.

Description

A description of the data in the data source. For example, "Smelting Plant Data."

Server

The name of an IndustrialSQL Server on your network. You can select a server from the list or enter the server name. The ODBC server name must be the same as the name given the IndustrialSQL Server during the DB-Library configuration. You can enter the name for the server or choose the server name from the drop-down list.

For more information about server names for different types of networks, see Microsoft SQL Server Setup.

Network Address

The address of the IndustrialSQL Server from which the driver retrieves data. For IndustrialSQL Server you can usually leave this value set to (Default). If you are using a Net-Library other than the default, this address should match the connection string in that Net-Library's configuration.

Network Library

The name of the SQL Server Net-Library DLL that the SQL Server driver uses to communicate with the network software. If the value of this option is (Default) the SQL Server driver uses the client computer's default Net-Library. The DB-Library is configured using the SQL Server Client Configuration Utility. The default Net-Library is specified in the Default Network box in the Net-Library tab of the SQL Server Client Configuration Utility.

Note If you create a data source using a non-default Net-Library and an optional network address, a new server name entry will be created. This new server name will appear in the list of servers in the **Advanced** tab of the SQL Server Client Configuration Utility. These server name entries can also be used by DB-Library applications. This Net-Library name and network address must be the same as used in configuring the DB-Library server.

Database Name

The name of the IndustrialSQL Server database, usually *Runtime*. For further information on the options, click on the help button.

Important! The **Generate Stored Procedure for Prepared Statement** check box must not be selected.

Using File Data Source Names with IndustrialSQL Server

MS Query 8.00, which is shipped with Office97, can only use file data source names (DSNs). File DSNs cannot be used directly with IndustrialSQL Server because the ODBC driver for SQL Server is still only version 2.x (current ODBC drivers are typically version 3.x) and there is no way to turn off the **Generate Stored Procedure for Prepared Statement** option.

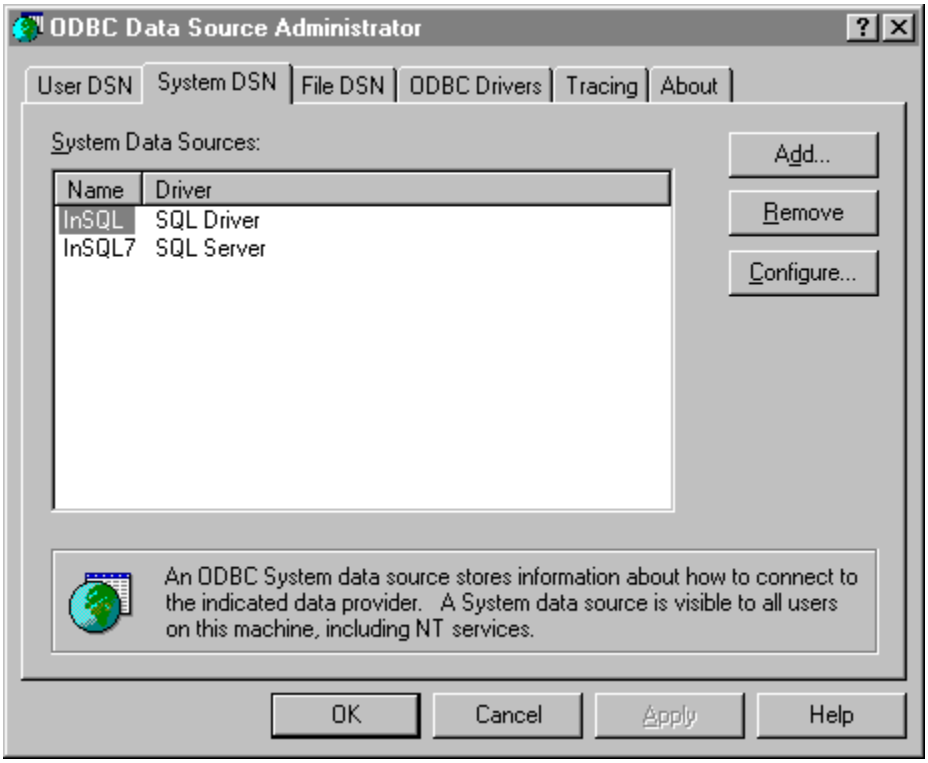
However, you may create a file DSN that points to a machine DSN (either user DSN or system DSN) that does have the **Generate Stored Procedure for Prepared Statement** option turned off.

➢ **To create a system DSN:**

1. In Control Panel, double-click the ODBC icon.

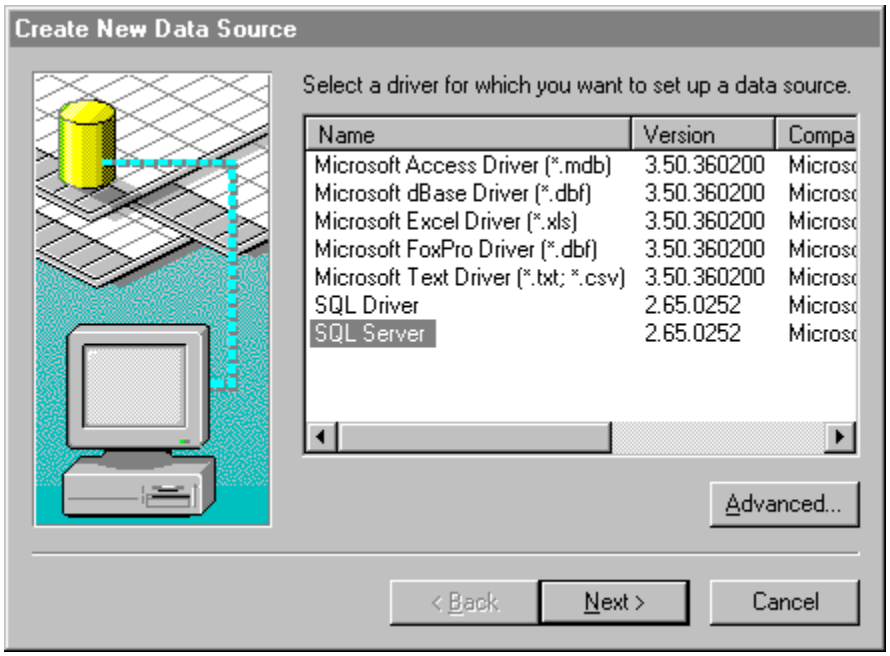
   The ODBC Data Source Administrator dialog box appears.

2. Click the **System DSN** tab.



3. Click **Add**.

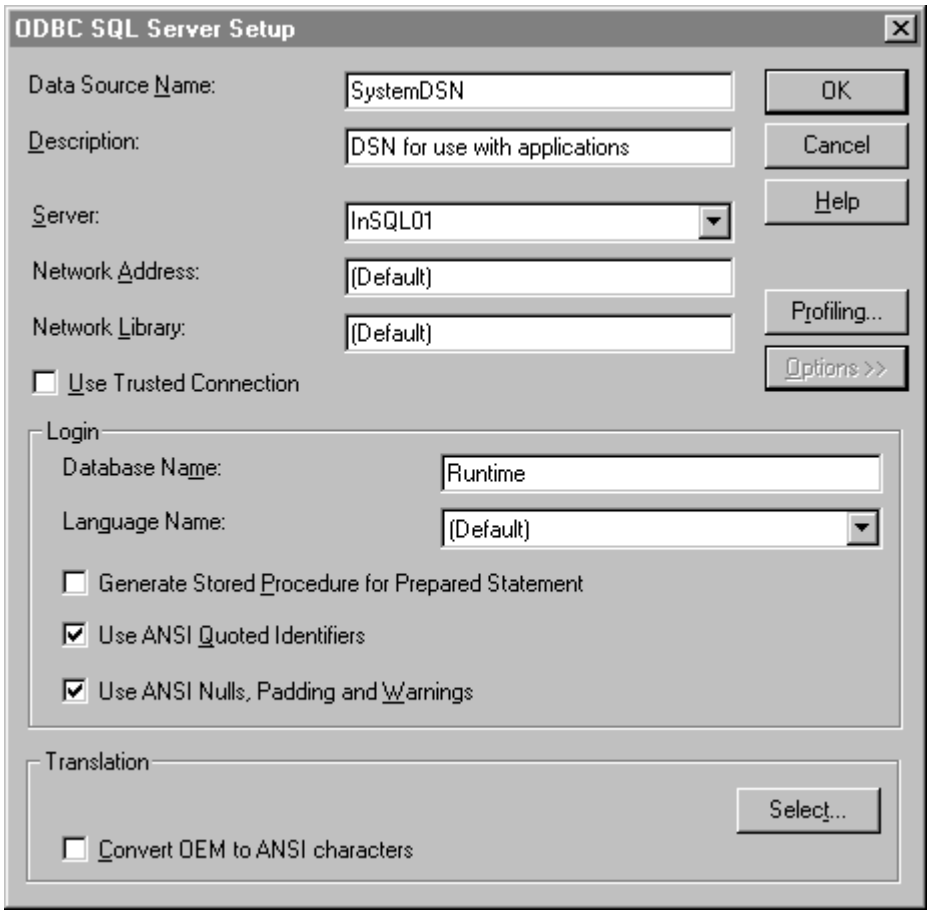
4. The **Create New Data Source** dialog box appears.



5. Select **SQL Server** and click **Next**.

   There is no functional difference between **SQL Server** or **SQL Driver** since both use the same .DLL.

   The **ODBC SQL Server Setup** dialog box appears.



6. Enter the ODBC details for the data source.

   The Data Source Name that you enter will be used later in configuring the file DSN.

   Important! Be sure that you **do not** check the **Generate Stored Procedure for Prepared Statement** option.

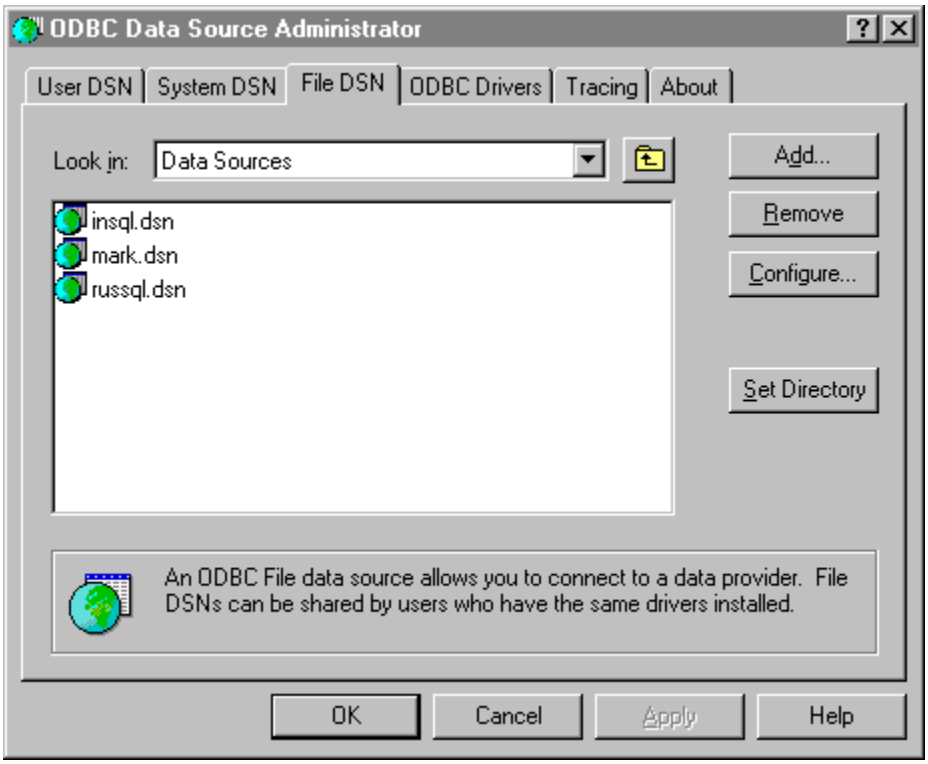
7. Click **OK**.
8. Go to the next section for information on setting up a file DSN.

➢ **To create a file DSN:**

1. In Control Panel, double-click the ODBC icon.

   The ODBC Data Source Administrator dialog box appears.

2. Click the **File DSN** tab.



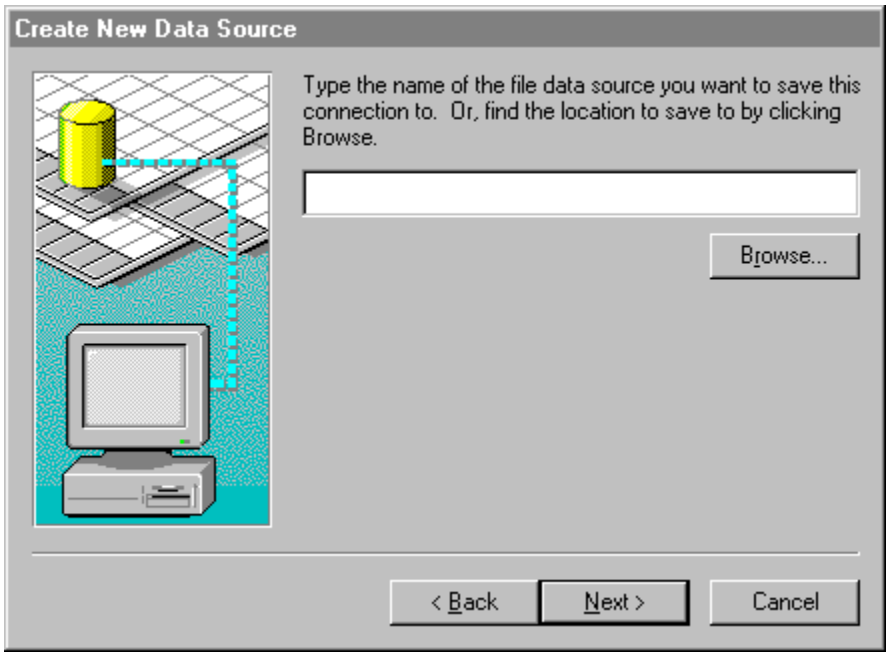
3. Click **Add**.

   The **Create New Data Source** dialog box appears.

4. Select SQL Server and click **Next**.

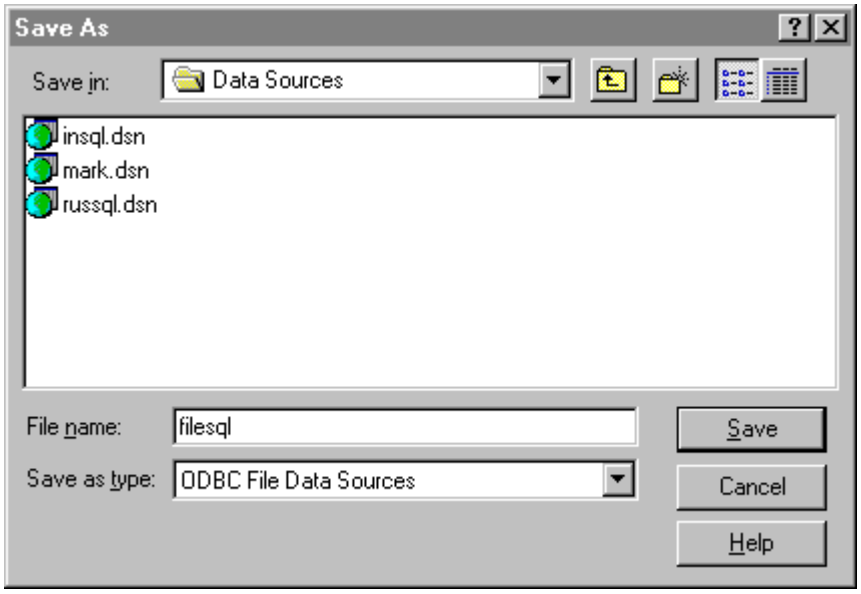
   There is no functional difference between **SQL Server** or **SQL Driver** since both use the same .DLL.

   The next panel for the **Create New Data Source** dialog box appears.



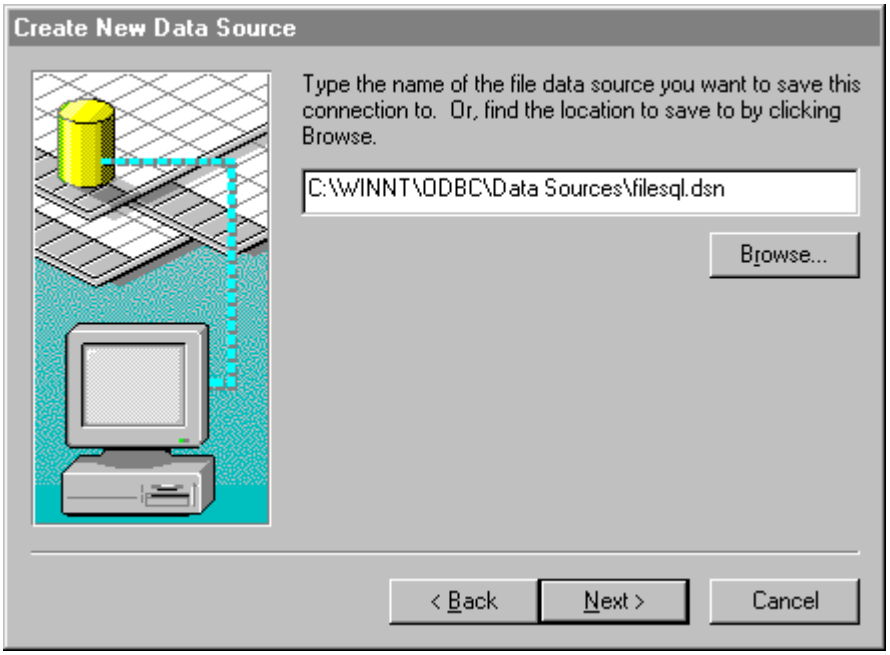
5. Click **Browse**.

   The **Save As** dialog box appears.



6. In the **File name** box, enter the name for the file DSN.

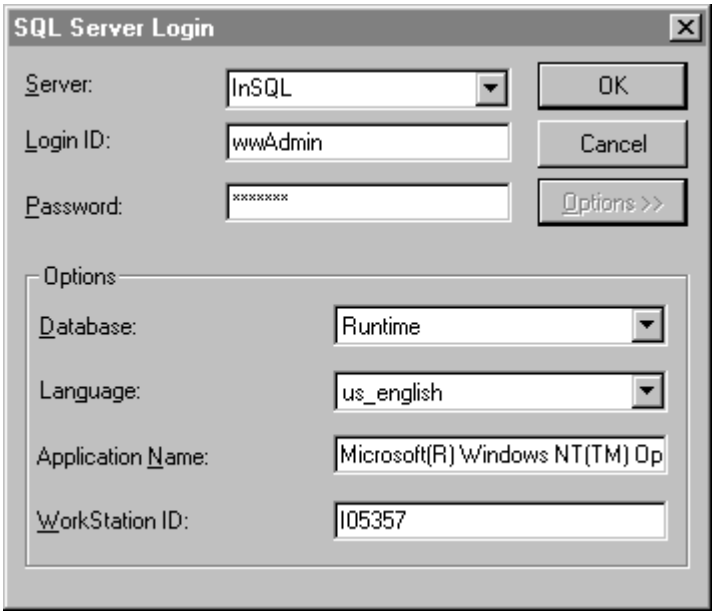
   The next panel for the **Create New Data Source** dialog box appears.



7. Note the path of the new file DSN. You will later edit this file using Notepad. Click **Next**.

8. Click **Finish**.

9. The **SQL Server Login** dialog box appears. Click **Options** to expand the dialog box.



10. Enter the required login options for the SQL Server.

    Server
    Name of the SQL Server to use as the data source.

    Login ID
    Your login identification to gain access to the SQL Server.

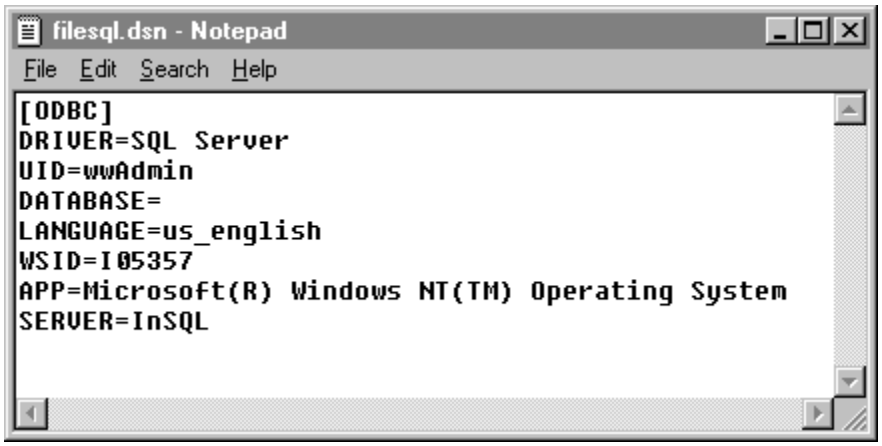
Password
Your password to gain access to the SQL Server.

Database
The name of the database. For IndustrialSQL Server, use "Runtime."

11. Click **OK**.

➢ **To edit the file DSN:**

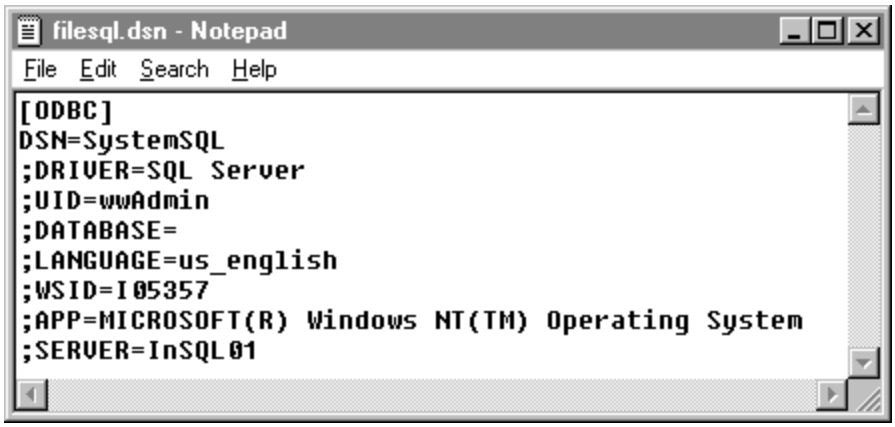
1. Use Notepad to edit the newly created file DSN. For example:



2. Comment out all entries under the `[ODBC]` section and add the following new entry (use the new system DSN that you created in the preceding procedure):

   `DSN=SystemSQL`

   For example:



3. Close Notepad.

The new DSN can now be used with ODBC client applications which use a file DSN (for example, Microsoft Excel or MS Query 8.00).

Configuring ODBC the InBatch Historical Databases

Open Database Connectivity (ODBC) allows ODBC reporting clients, such as Microsoft Access and Crystal Reports, to access the Wonderware® InBatch™ Historical Databases. This section explains how to configure an ODBC connection to the InBatch Historical Databases.

There are two ways to set up an ODBC Gateway: local and remote. The local gateway should be implemented only for development purposes. It is not supported for runtime operation. The local gateway requires that the InBatch Server, ODBC Gateway, ODBC Client (that is, Microsoft Access, Crystal Reports) and the ODBC Select utility are on the same computer. This configuration is resource-intensive and will likely degrade the performance of your runtime batch system; however, this can be an acceptable configuration if ODBC reporting can be restricted to periods when the runtime system is idle. The remote gateway is the recommended configuration for a runtime system. It requires that the InBatch Server be loaded on a single computer, while the ODBC Gateway, ODBC Client, and ODBC Select utility run on a separate computer.

Configuring a Local ODBC Gateway Server

➢ **To load a local ODBC gateway server:**

1. Run the Setup program from the InBatch (version 4.2 or later) CD-ROM and install the InBatch Server, if it is not already installed. Then reboot the computer.
2. Run the Setup program again from the InBatch CD-ROM, but this time select the ODBC Gateway Installation option and then select the Local Gateway Server. The Setup program will add the required files and programs to the folder.
3. Reboot the computer when the installation completes.

The ODBC service is named Velocis(InBatch) and is configured by default for Manual Startup in the Windows NT Services program. Before you can access the InBatch databases using ODBC, manually start the Velocis(InBatch) service by double-clicking the **Services** icon in the Windows **Control Panel**.

Adding the ODBC History Selector Utility to the InBatch Environment Display

You must load the local ODBC gateway server before adding the ODBC History Selector Utility.

➢ **To add the ODBC History Selector utility:**

1. Start the Environment Editor from the Environment Display.
2. Click Add on the Environment Editor main window.
3. In the Applications dialog box, click Other to display the User Defined Applications Editor.
4. Enter ODBCselect in the Application field.
5. Select Editor as the Type.
6. Click Add. The application is added to the User Defined Applications list.
7. Close the User Defined Applications editor. The ODBC select application should now appear selected in the Applications list.
8. Close the Environment Editor and then update the Environment Editor.

After it has been installed, the ODBC History Selector Utility can be accessed from the Environment Editor or from the taskbar by selecting Start/Programs/InBatch ODBC Gateway - 4.2/ODBC History Selection.

If you have not started the Velocis(InBatch) Service, or if you have not added the ODBC Select application to the Environment Display, you will see an error message indicating that a connection to the ODBC Gateway cannot be established.

Start the ODBC History Selection. This should make a connection to the InBatch server computer and make the History files available for reporting. You are now ready to use Crystal Reports or Access to create your reports.

Loading the Remote Gateway Server

After the InBatch Server is installed on one computer, share the InBatch or BatchSrv directory that is on that computer. On the second computer, where the ODBC gateway will be installed, map a drive letter to the shared directory that you just created and then follow these steps:

1. Start the Setup program from the InBatch (version 4.2 or later) CD-ROM.
2. Select the ODBC Gateway Installation option.
3. Select Remote Gateway Server
4. When you are prompted to enter a directory, do one of the following:
   - If the directory InBatch is shared on the InBatch Server for Remote Dir, then type the drive letter, followed by BatchSrv (example, d:\BatchSrv); or
   - If the directory BatchSrv is shared on the InBatch Server, then type only the drive letter (example, d:\)
5. The installation program will add the required files and programs to the folder. Reboot the computer when the installation completes.

ODBC operation on a remote system requires that you change the Velocis (InBatch) server from Local System Account (this is the default account when InBatch is installed) to a valid user account (typically the account that was used to install the batch server).

From the Windows Control Panel, double-click the Services icon. Select the Velocis(InBatch) service and then click the Startup button. In the Log On As section, enable the This Account radio button. Click the drop down arrow and pick an appropriate user in the Names list (usually this is the user name that you used to log onto Windows NT 4.0). Click OK. Enter the appropriate password for the account (usually this is the password that you used to log onto Windows NT 4.0; consult your system administrator if you need assistance). You are now ready to start the Velocis(InBatch) service.

Note If you have not started the Velocis(InBatch) service or added the ODBC Select application to the Environment Display, you will see an error message indicating that a connection to the ODBC Gateway cannot be established.

From the Start menu, under Programs, select InBatch ODBC Gateway 4.2 and start the ODBC History Selection. This should connect to the InBatch server computer and show the History files available for reporting. You are now ready to use Crystal Reports or Access to create your reports.

You will receive a warning if you select a database when any of the following three conditions are true.

- The first time that you run the ODBC Selector utility. (In this case, you may ignore the warning.)
- The current ODBC enabled database changed from an active to an archive state (that is, it was automatically renamed) and the database is no longer available as the name shown in the list.
- The selected database was renamed, deleted, or moved. Click OK on the Warning dialog box, then Refresh and Select a different item.

Note that the concept of ODBC connectivity and the configuration of report applications to access ODBC data is beyond the scope of this Tech Note. You should consult the appropriate manufacturer's reference manual for more information. Wonderware, however, does provide a sample report for Crystal Reports (version 5.0 only) which demonstrates the basic implementation of the lookup tables. This sample is located in:

```
//InBatch/BatchSrv/Gateway/Support
```

Setting Up a Redundant InBatch Server

Redundancy is an option when installing InBatch servers and clients. However, the order in which the components of the system are deployed is important. The system must be deployed in the following order.

1. Establish a valid network configuration.
2. Install redundant InBatch Servers
3. Install and configure InBatch clients.

Network Configuration

Before installing redundant InBatch servers, the network must be properly configured. Each server will be equipped with two network interface cards (NICs); each NIC will be assigned a uniquely addressable host name and a corresponding IP address. One NIC in each server can be designated the primary, and the other NIC the secondary. Primary NICs are connected to the Local Area Network (LAN), the secondary NICs are directly connect by a single crossover network cable. By establishing two independent network paths between the servers, the InBatch Redundancy Managers can send the required heartbeats over both paths simultaneously. Use the following checklist to verify proper network configuration (An example configuration is provided).

Note Redundant Network Configuration must be performed by qualified personnel.

- Dual Network Interface Cards – Two NICs must be present in each server.
- Protocol - Each server must be configured for the TCP network protocol.
- Hostnames - Each server must be configured with two host names, one for each NIC.
- Network Addresses - Each NIC, on each server, must be assigned a proper IP address. It is critical that the two addresses assigned to the NICs on a single server are from different networks. This will ensure that the network connection is used when communicating the "heartbeats". If these addresses differ only at the host level, redundancy will not work properly
- Lmhosts – Lmhost lookup must be enabled as a TCP/IP property. The set of four network addresses must be loaded into the lmhosts file. This loading ensures the fastest possible name resolution. Sample entries for the lmhosts file are given in the example that follows.
- Verification - Communication between both servers and both paths must be tested and verified.

Example – Redundant Network Configuration

Two computers, "Jupiter" and "Saturn," have been designated for use as redundant batch servers. Both servers are equipped with identical network cards. The secondary NICs have been connected with a crossover type network cable. The servers will participate on a domain named "Planets." The primary NICs within each server have been connected to the LAN. Additionally, the LAN has been configured to use Class "C" network addressing. The servers have also been assigned alternate hostnames and a set of four network addresses. The LMHOST file contains the following information.

```
198.243.117.1     Jupiter   #PRE    #DOM:PLANETS
10.199.199.1      Jupiter2  #PRE    #DOM:PLANETS
198.243.117.2     Saturn    #PRE    #DOM:PLANETS
10.199.199.2      Saturn2   #PRE    #DOM:PLANETS
```

There are several issues to consider when reviewing the parameters in the above file.

- Jupiter and Saturn are the primary hostnames while Jupiter2 and Saturn2 are the alternate hostnames.
- The NICs must be configured to show the above address assignments.
- The two secondary addresses ("Jupiter2" and "Saturn2") are on a different network than the two primary addresses.
- Please note that the addresses given above are for the purposes of this example. Your actual network addresses must be approved by your network administrator.

The lmhosts file must be loaded into the system. After all configuration items have been completed, you should verify the connections between the two servers using the following guidelines.

- Use the `ipconfig -all` command.(at the DOS command prompt) to confirm that both network addresses are properly configured for each host. Ensure that you perform this verification on both servers.
- Use the `nbtstat -c` command to confirm that the network addresses of all four hosts are correct and are accessible to both servers. This verifies that the lmhost entries were corrected loaded.
- Execute the `ping <hostname>` command on both servers to verify the communications path between the primary and secondary hostnames to each of the servers.

Note You must perform the above configurations and verifications before you install InBatch.

Batch Server - Redundancy Installation

Redundancy is an optional feature of InBatch. It is installed on BOTH servers using the InBatch installation program. You will be presented with a series of dialog boxes that will prompt you for specific information about your network.

To install InBatch with redundancy, follow these guidelines:

1. Insert the proper FactorySuite CD into the CD-ROM drive.
2. Run the setup program (setup.exe) on the Suite CD.
3. Select InBatch from the Factory Suite installation menu.
4. When you see the InBatch **Installation Options** dialog box, click the In**Batch Server** button.
5. Proceed through the installation until you see the dialog box containing the Redundancy check box.
6. Click the **Redundancy** check box and then click **Next>**.
7. Enter the hostname and alternate (hostname) of the other redundant system in the dialog box.
8. Click **Next>**.
9. Follow the remaining installation instructions.
10. Setup will automatically create a program group with icons for the InBatch Server.
11. Repeat these steps on the other server, substituting the appropriate hostname and alternate hostname for the redundant system.

Batch Client - Redundancy Configuration

A Batch Client is configured for redundancy using the InBatch installation program. You will be presented with a series of dialog boxes that will prompt you for specific information about your network.

Important Before you begin configuring a Client for redundancy, you must first have valid network connections between your servers and each Client. If you are going to install Batch Development clients, you must then configure each of the

Server Configuration

1. On each of the redundant batch servers, create a share of the directory in which the InBatch applications are located. For example, the default installation folder is c:\Program Files\FactorySuite\InBatch
2. On each Batch Development Client, map two network drives. Each drive must correspond to the appropriate Batch Server.
3. When properly configured, each Development Client will have two additional network drive letters available; one which provides a connection to the master server , and one which provides a connection to the backup system.

Batch Client Configuration

1. Insert the proper FactorySuite CD into the CD-ROM drive.
2. Run the setup program (setup.exe) on the Suite CD.
3. Select InBatch from the Factory Suite installation menu.
4. When you see the InBatch **Installation Options** dialog box, click the In**Batch Client Options** button.
5. Select the Client type.
6. When prompted, enter the hostname of the Primary Batch server. If you are installing a Batch Development Client, enter the local drive letter that is mapped to the appropriate Batch server's InBatch folder. Continue to the next dialog.
7. Click the **Redundancy** check box and then click **Next>**.
8. Enter the host name of the other batch server. Again, if you are installing a Batch Development Client, you must enter the local drive letter that maps to the other batch server's InBatch folder.
9. The Installation program will create two program groups. Each set of icons within each program group are specifically associated with the batch server identified in the title bar.

Redundancy - Switch-Over Configuration

IMPORTANT A thorough understanding of this section is absolutely critical to the proper deployment of a Redundant Batch System.

After installing and configuring the Batch servers as described previously, you should verify that the Servers are capable of properly switching over batch control. In the following discussion, it is assumed that either server could be acting in the role of a master or backup. When the batch servers are started for the first time, the server that actually boots first will assume the responsibility of the Master. Thereafter, the role of each server is determined by the information contained in the local RedState file on each system. Please consult the InBatch Users Guide for additional information on the Operation of Redundant Batch servers.

Redundant batch server operation is controlled by a Redundancy Manager process that runs on each server. The "heatbeat" is exchanged over the network between these two processes. Each Redundancy Manager controls the other local InBatch processes. When a switch-over event occurs, the associated process activity is controlled by the Redundancy Manager

A system parameter in the Environment called "Redundancy TimeOut" is used to set the switch over delay. The value is configurable by the user and is specified in seconds. Editor

For more information on Environment Manager, see your *InBatch User's Guide*.

In the event a Redundant Batch sever has failed to detect the other servers heartbeat, it will wait for the configured time before initiating a switch-over.

The normal state of an InBatch Redundant system has one server acting as a "Master with Valid Backup" and the other server acting as a "Valid Backup." The role of an active InBatch server can be determined by opening the status window on the Environment Display.

When a switch-over occurs, the server currently acting as the backup will switch-over and become a "Master with Invalid Backup." The server currently acting as the master, will switch-over to a "Master with Invalid Backup." The expectation is that a system failure on one of the servers has triggered the switch-over event; therefore, normally after a switch-over, only one server is acting as the Master.

In the event of complete communications failure between the two Redundancy Managers, a switch-over event may be initiated by both servers, in which case there will be two Masters. If this occurs, proper Batch control is not guaranteed and operator intervention is mandatory. Avoiding this situation is, in fact, a primary requirement when deploying a redundant InBatch system. This type of communication failure between the two servers can occur for a variety of reasons. For example, the simultaneous loss of both networks for a period of time at least equal to the switch-over setting, or, the execution of any process on a batch server which completely consumes system resources (CPU, network etc.).

For this reason, Wonderware strongly recommends that the expected batch server load is given careful consideration and hardware resources are gauged accordingly. Resource intensive applications such as screen savers should be disabled on the Batch servers, as they could cause the problem of “two master systems.” Prior to deploying a Redundant Batch system into the production process, the load and resource utilization on both Batch servers must be assessed, and a reasonable assurance of adequate resources for InBatch must be achieved.

CHAPTER 5

Protocols

This chapter provides background information on the main protocols used between components of the FactorySuite. A protocol is the set of rules and standards for enabling computers to connect and exchange data over the network. This chapter also includes information on setting up and using these protocols.

Contents

DDE

Dynamic Data Exchange (DDE) is a communication protocol developed by Microsoft to allow applications in the Windows environment to send/receive data and instructions to/from each other. It implements a client-server relationship between two concurrently running applications. The *server* application provides the data and accepts requests from any other application interested in its data. Requesting applications are called *clients*. Some applications such as InTouch and Microsoft Excel can simultaneously be both a *client* and a *server*.

Requests for data can be one of two types: one-time requests or permanent data links. With one-time requests, the client program requests a "snapshot" of the desired data from the server application. An example of a one-time request would be a program (such as Excel) running a report-generating macro. The macro would open a channel to another application, request specific data, close the channel and use the data to generate the report.

Permanent data links are called "hot links." When a client application sets up a hot link to another application it requests the server application to notify the client whenever a specific item's data value changes. Permanent data links will remain active until either the client or server program terminates the link or the conversation. Permanent data links are a very efficient means of exchanging data because, once the link has been established, no communication occurs until the specified data value changes. Components of the FactorySuite can use DDE to communicate with I/O device drivers and other DDE application programs.

FastDDE

FastDDE provides a means of packing many Wonderware DDE messages into a single Microsoft DDE message. This packing improves efficiency and performance by reducing the total number of DDE transactions required between client and server.

Configuring DDE Shares

InTouch is shipped with the Wonderware NetDDE product, portions of which were licensed to Microsoft as Network DDE for use in Windows for Workgroups, Windows 95, and Windows NT operating systems.

In order to allow NT Network DDE to act as a resource for a FactorySuite component (such as InTouch or IndustrialSQL Server) it must be modified.

Note DDE shares must be created for all nodes running Windows NT with DDE resources that InTouch View nodes may need. For example, if you have a node running a GE Genius (NT) IO server, you must create a DDE share for that server if InTouch is to access those resources. To run the InTouch application on a Windows NT node, a specific InTouch for Windows NT application package must be installed on the node.

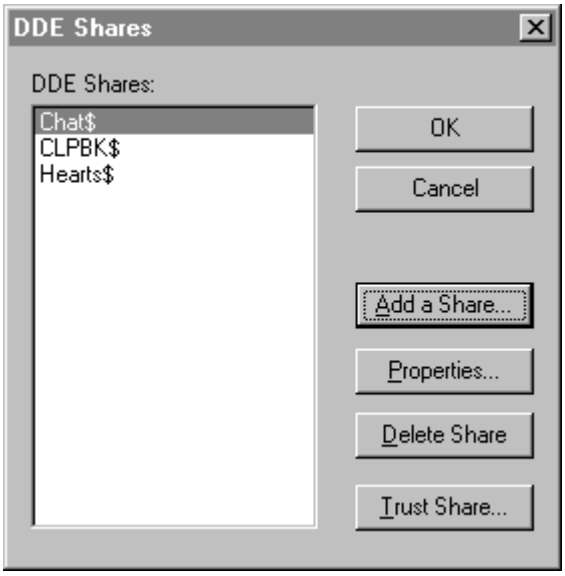
➢ **To add a DDE Share on the Windows 95 or Windows NT operating systems:**

1. On the **Start** menu of the Windows Taskbar, point to **Run**. In the **Run** dialog box that appears, type DDESHARE and then click **OK**.

   The DDE Share program's main window appears.

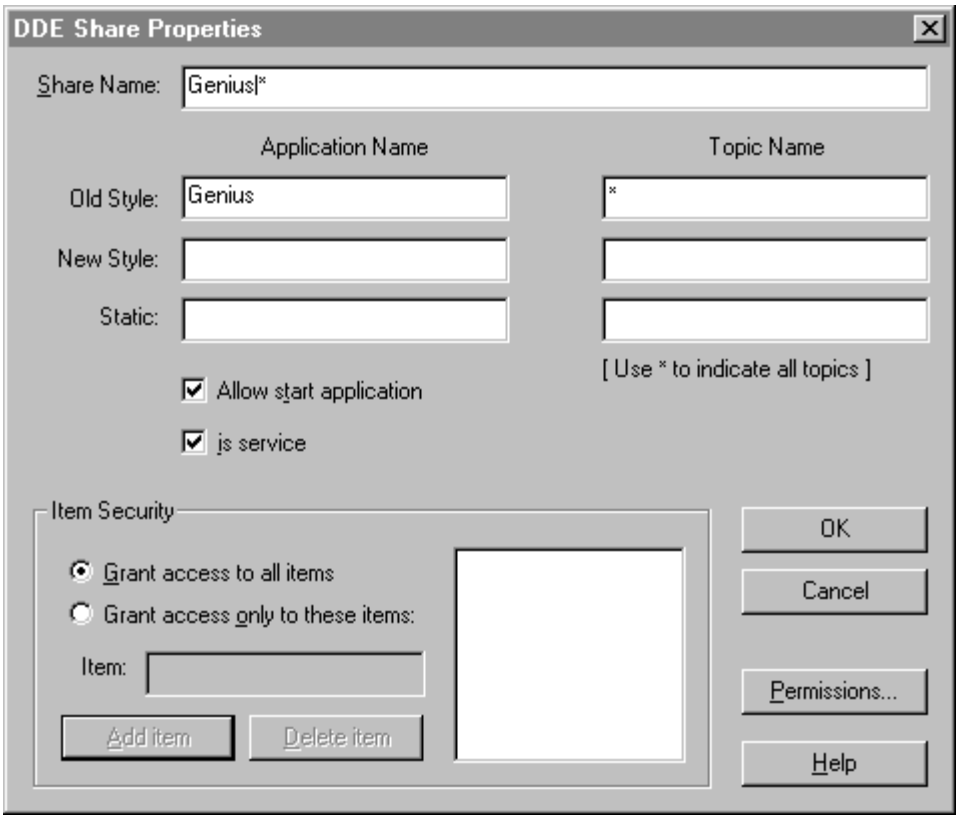
2. From the **DDE Shares** menu, click **DDE** Shares.

   The **DDE Shares** dialog box appears.



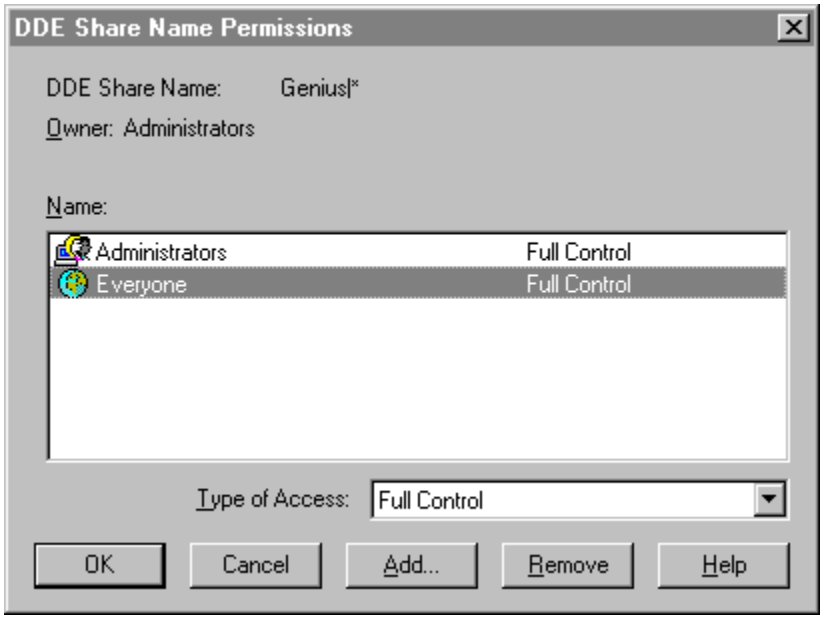
3. Click **Add a Share**.

   The **DDE Share Properties** dialog box appears.



4. In the **Share Name** box, enter the name of the DDE application and "|*" for the Share Name. For example, if your server application is GE Genius, enter Genius|*.
5. In the **Application Name** box, enter the name of the application again.
6. In the **Topic Name** box, enter "*".
7. Click **Permissions**.

   The **DDE Share Name Permissions** dialog box appears.



Note If DDE Share is initially configured with "Administrator" permission, then shares will be automatically set up for Distributed Alarms.

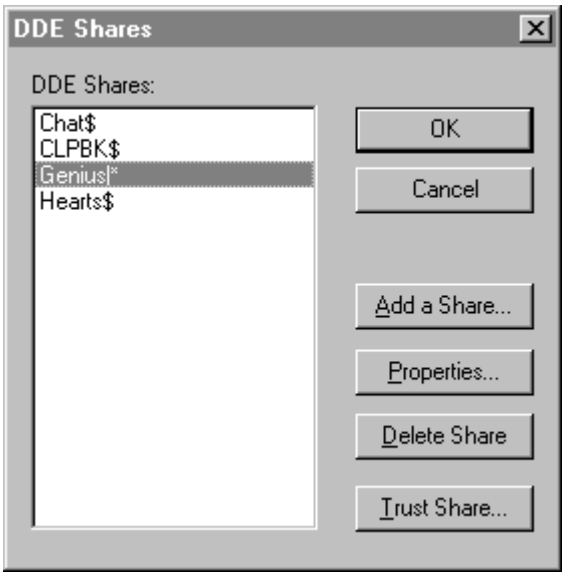
8. Select "Everyone" in the Name list and "Full Control" as the Type of Access.
9. Click **OK** to exit the DDE Share Name Permissions dialog box and return to the DDE Share Properties dialog box.
10. Click **OK** to return to the DDE Shares dialog box.

The share you created will now be included in the DDE Shares list.

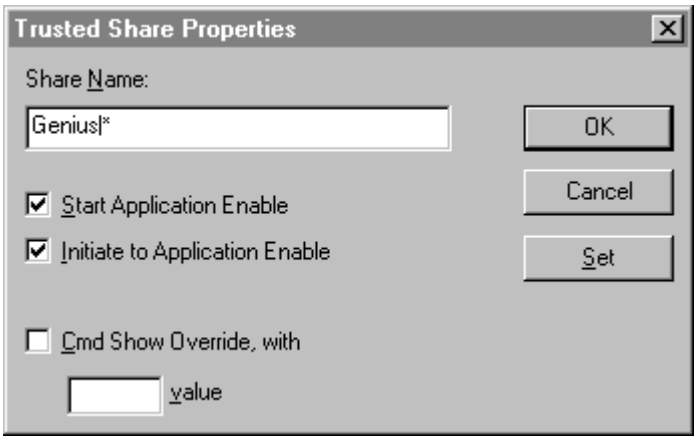
📖 For more information on using the DDE Share program, see your Microsoft documentation.

➢ **To configure trusted DDE share.**

1. From the **DDE Shares** menu, click **DDE** Shares.
2. In the **DDE Shares** dialog box that appears, select the DDE share for which you want to set up a trust relationship.



3. Click **Trust Share**.
4. The **Trusted Share Properties** dialog box appears.



5. Click the **Start Application Enable** and **Initiate to Application Enable** options.
6. Click **OK**.

NetDDE

NetDDE extends the standard Windows DDE functionality to include communication over local area networks and through serial ports. Network extensions are available to allow DDE links between applications running on different computers connected via networks or modems. For example, NetDDE supports DDE between applications running on IBM PCs connected via LAN or modem and DDE-aware applications running on non-PC based platforms under operating environments such as VMS and UNIX.

Microsoft Windows NT Operating System and NetDDE

Microsoft's version of NetDDE is included in the Microsoft Windows NT operating system product. To install Microsoft Windows NT operating system on the local node, refer to your *Microsoft Windows NT System Guide*. If you are a new Microsoft Windows NT operating system user, it is recommended that you read this Guide to familiarize yourself with Microsoft Windows NT operating system and NetDDE's role in providing DDE connectivity between various operating environments.

Windows NT Networking Support

NetDDE, included with the Microsoft Windows NT operating system, runs transparently to the user and expands the standard Microsoft Windows DDE (Dynamic Data Exchange) functionality to include communication over various networks. To use it, two or more IBM compatible PCs running Microsoft Windows NT operating system is required. Microsoft Windows NT operating system must be installed on all network nodes between which DDE data is to be exchanged.

Microsoft Windows NT operating system includes built-in networking support, a component of which is NetDDE with the NetBIOS interface. The networking software chosen for installation on the local node will depend on what other PCs and workstations you intend to connect to with Microsoft Windows NT operating system.

The WinSock network interface configuration extension allows easy configuration of the WinSock interface without having to access the Windows NT Registry Editor.

No networking software package is required for stand-alone remote PCs that dial in to a network system.

Included Extensions

NetDDE Extensions for Windows NT operating system includes the DDE Share Security extension and the WinSock network interface extension.

The DDE Share Security extension allows you to configure a DDE Share Security policy and to administer the configured DDE Share Security policy when remote workstations attempt to gain access to DDE data available at the local node. With this extension, configurations can be made easily without having to use the Windows NT operating system standard security dialogs.

☞ For more information , see "Configuring DDE Share Security" later in this chapter.

The WinSock network interface extension allows you to easily configure the WinSock interface without having to access the Windows NT Registry Editor.

☞ For more information, see "Configuring the WinSock Interface" later in this chapter.

System Requirements

To install NetDDE Extensions for Windows NT operating system, the following minimum system requirements must be met:

- Microsoft Windows NT operating system 3.51 or later. If running Wonderware InTouch 7.0 you must have Microsoft Windows NT 4.0 operating system installed.
- TCP/IP Network Protocol installed.

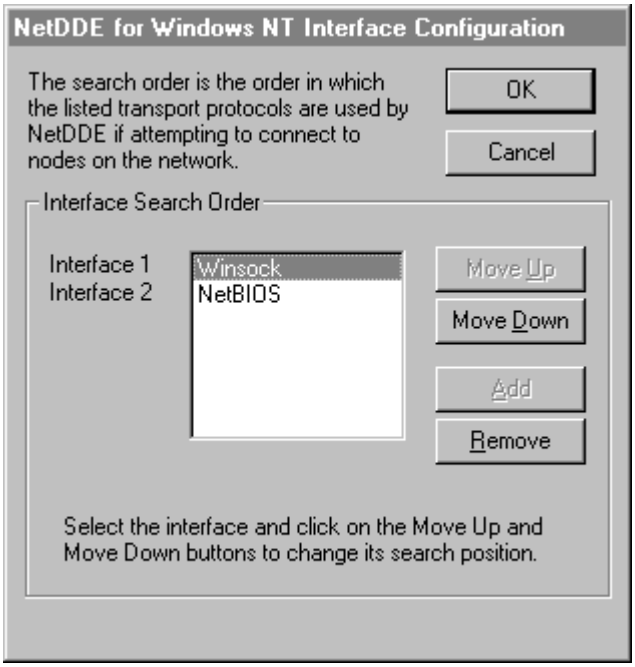
Interface Configuration

When using NetDDE for Windows NT operating system, the interface search order needs to be configured.

➢ **To configure the interface:**

1. On the **Configure** menu, click **Interfaces**.

   The **NetDDE for Windows NT Interface Configuration** dialog box appears.



2. Click the **Move Down** button to switch the search order for the interface. For example, Interface 1, which is the first search order listed is Winsock. When the **Move Down** button is clicked the order changes. Interface 1 is now listed as NetBIOS and will be the first interface searched.
3. Click **OK** to accept the new search order and close the dialog box.

Configuring DDE Share Security

Since Microsoft Windows NT operating system allows access by remote workstations to DDE data stored on the local node, a security policy is created to prevent unauthorized access. With a DDE Share Security policy in place, access must be explicitly granted to shared DDE data available at the local node. Likewise, a remote workstation that wants access to secured DDE data must be able to respond appropriately to the requirements exacted by the DDE Share Security subsystem in Microsoft Windows NT operating system.

The DDE Share Security extension allows you to configure a DDE Share Security policy and to administer the configured DDE Share Security policy when remote workstations attempt to gain access to DDE data available at the local node. Using NetDDE Extensions makes it easier to configure the security issues then using Microsoft Windows NT operating system standard security dialogs.

DDE Shares

DDE shares correspond to DDE data maintained by DDE-aware server applications. Some applications, such as Wonderware InTouch and Microsoft Excel, can be both DDE clients and DDE servers on the local node. DDE shares are defined in the DDE shares database maintained by the operating system on each node. The DDE shares database stores the name of each application and topic pair that can be referred by a remote node in a Microsoft Windows NT operating system conversation. The DDE shares database also identifies the security permission levels for each DDE share that defines the access nodes available to that share.

A DDE share can be created for each DDE topic supported by a DDE-aware application. Or, a "wild card" DDE share, specifying "*" as the topic name, can be defined to enable access through Microsoft Windows NT operating system to all topics supported by the given DDE-aware application.

DDE Share Permission Levels

A DDE share representing an application and topic pair that has been explicitly defined in the DDE shares database is referred to as a "custom" DDE share. Each "custom" DDE share defined in the DDE shares database has a specific permission level assigned to it. The permission level assigned to the DDE share determines what type of access will be granted by Microsoft Windows NT operating system to remote workstations. The following permission levels can be assigned to a DDE share:

Full Access	Allows access to the specified application and topic from all remote workstations without any restrictions.
No Access	Allows no access to the specified application and topic from any remote workstation.
Read-Only	Allows only DDE Request and DDE Advise access to the specified application and topic from any remote workstation. No DDE Poke or DDE Execute access is allowed.
Permissions	Allows only DDE clients with the correct permission level to access data at the selected node. When selected the **Permissions** button will appear.

For more information, see "Security Configuration."

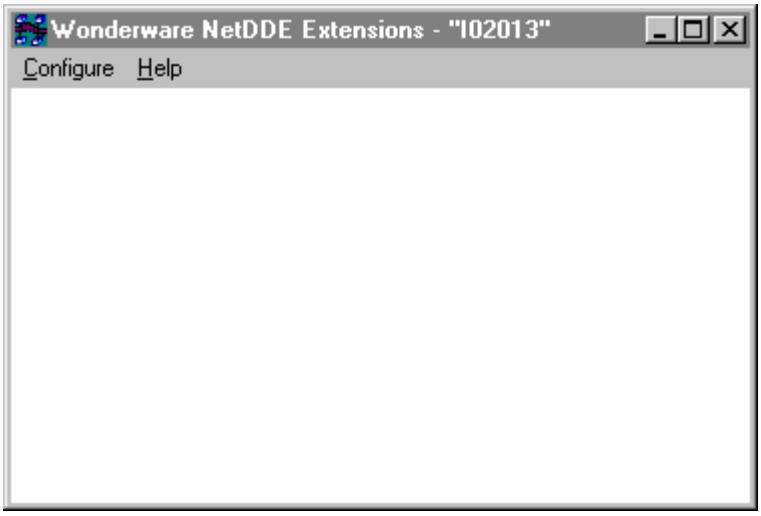
Default DDE Share Security

Default DDE Share Security is applied to all application and topic pairs that are not explicitly itemized in the DDE shares database. When Microsoft Windows NT operating system receives an initiate to a specific application and topic, it first interrogates the DDE shares database to see if specific security permission levels have been assigned. If a share for the specific application and topic pair has not been defined, Microsoft Windows NT operating system will use the security permission levels assigned to the default DDE share and apply them to the initiated DDE conversation. The default DDE share can be assigned the same security permission levels as "custom" DDE shares.

Security Configurations

➢ **To access DDE Share Security configuration:**

1. Execute **NetDDE Extensions**. The Wonderware NetDDE Extensions dialog box will appear:



2. On the **Configure** menu, click **Security**. The **Custom DDE Security Browser** dialog box appears:

3. In the **Default DDE Security on this Node** box, the default of Full Access appears. The default security level can be changed by configuring a new default setting.

Changing the Default DDE Share Security

The default DDE share can be defined and modified from the **Configure Default Security**.

➢ **To modify the default security level:**

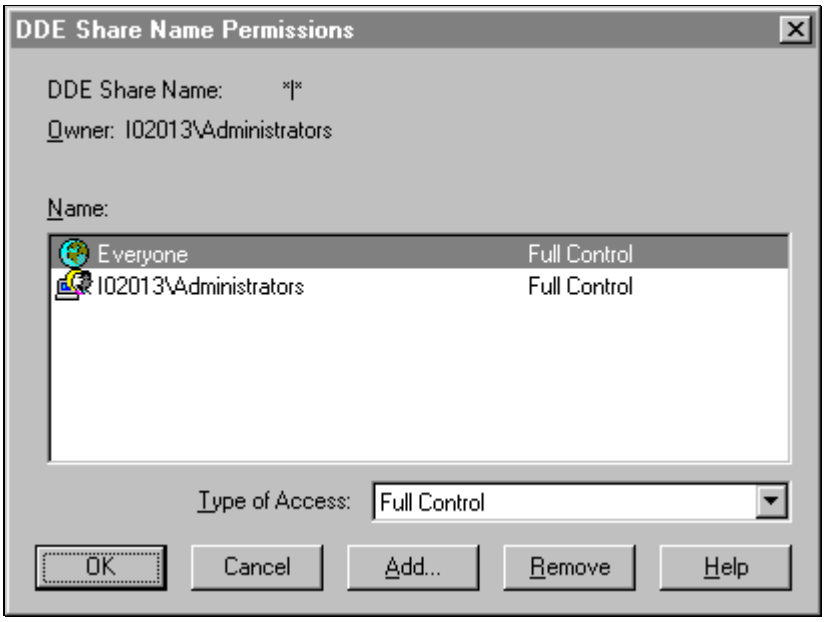
1. On the **Custom DDE Security Browser** screen, click the **Configure Default Security** button . The **Default DDE Security** dialog box will appear:

2. Select a **Default Access** option for the node. Descriptions for each option will appear in the field to the right of the option when selected.

By default, Microsoft Windows NT operating system assumes "Full Access" for the node and creates a corresponding default DDE share when it is activated (unless a DDE share already exists in the DDE shares database). This ensures a smooth transition from the Microsoft Windows NT operating system environment, allowing you to become gradually accustomed to securing DDE data in this manner.

For more information on permission levels, refer to the "DDE Share Permission Levels" section.

3. If the **Permissions** Default Access has been selected the **Permissions** button will appear. Select this button to view or change directory permissions. The **DDE Share Name Permissions** dialog box will appear:



4. In the **Type of Access** box select the access level for the DDE Share Name Permission.
5. Click **OK** to update the permission and close the **DDE Share Name Permissions** dialog box.

   For complete details on Access Types, refer to the *Microsoft Windows NT System Guide*.

6. Select the following **Default Options**:

Start on Connect	To start an application that is not already running on connection from the remote node. This option is disabled if the **Service** option is selected.
Trust Share	Allows other users to access the share. Otherwise, only local applications can be accessed. This option can be used to remove all access to the share without having to delete the share.
Service	Select when the share is an installed Microsoft Windows NT operating system service and is started at system boot time. This option is disabled if the **Start on Connect** option is selected.

7. Click **Cancel** to close the dialog box, without saving changes.
8. Click **OK** to accept changes and return to the **Custom DDE Security Browser** dialog box.

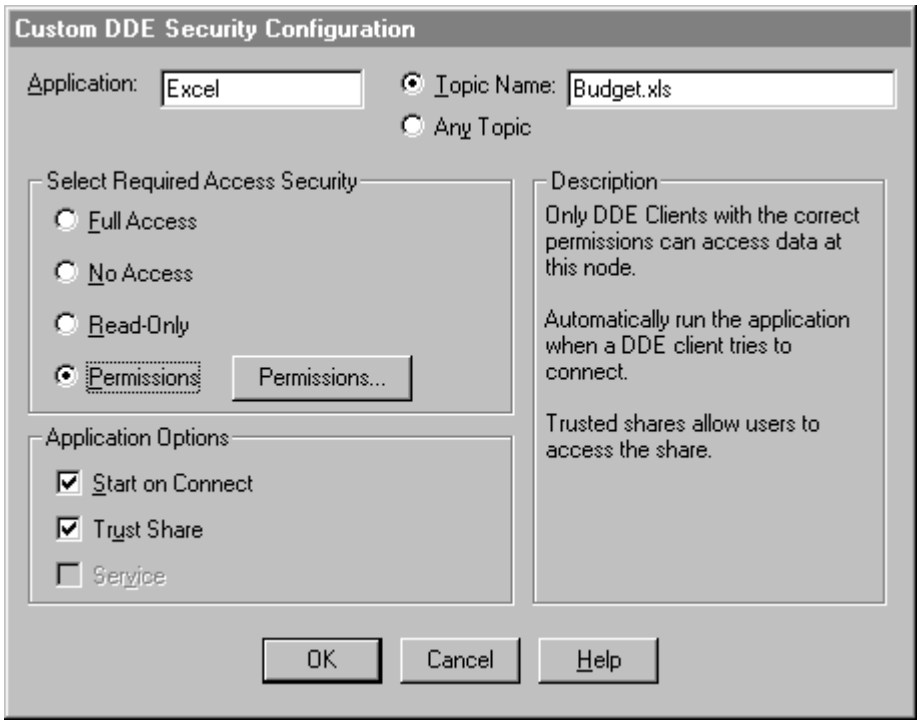
Customized DDE Shares

The DDE shares database can be edited using the DDE Share Security extension. New "custom" DDE shares can be added and existing shares modified. The **Custom DDE Security Browser** allows you to view existing "custom" DDE shares and initiate actions to add, modify or delete selected DDE shares.

➢ **To add Custom DDE Shares**

1. On the **Configure** menu, click **Security**. The **Custom DDE Security Browser** dialog box appears:

2. Click **Add**. The **Custom DDE Security Configuration** dialog box will appear:



3. In the **Application** box, type the name of the application. For example, Excel.
4. Select **Topic Name** and type the name of the application in the box. A security levels can now be assigned to this topic. For example, Budget.xls is the topic name of the application Excel that now has a password required to read and write to the topic.
5. Select **Any Topic** to allow access to all topics in your application.
6. In the **Select Required Access Security** group, select the desired security permission level to be assigned to the custom DDE share. Descriptions for each option will appear in the field to the right of the option when selected.

   For more information on permission levels, refer to the "DDE Share Permission Levels" section.

7. In the **Application Options** group, select the from the following options:

   Start on Connect — To start an application that is not already running on connection from the remote node. This option is disabled if the **Service** option is selected.

   Trust Share — Allows other users to access the share. Otherwise, only local applications can be accessed. This option can be used to remove all access to the share without having to delete the share.

   Service — Select when the share is an installed Microsoft Windows NT operating system service and is started at system boot time. This option is disabled if the **Start on Connect** option is selected.

8. Click **Cancel** to close the dialog box, without saving changes.
9. Click **OK** to accept changes and return to the **Custom DDE Security Browser** dialog box will appear with the added Application Name and Topic Name:

10. To view each nodes security permission level assigned to a custom DDE share, select the application from the **Application Name** field and then select the topic from the **Topic Name** field. All topics in this list are associated with the selected application. The security level will appear in the **Security for Selected App/Topic** field.
11. Click **Done** to close the dialog box and save security changes.

➢ **To modify a DDE Share**

1. On the **Custom DDE Security Browser** dialog, select the Application Name and Topic Name you need to modify.
2. The **Custom DDE Security Configuration** screen appears.
3. Make the necessary modifications to the security access and application options.
4. Click **OK** to return to the **Custom DDE Security Browser** dialog box.

➢ **To delete a DDE Share**

1. On the **Custom DDE Security Browser** dialog, select the Application Name and Topic Name you want to delete.
2. A message box will appear confirming your delete request.
3. Click **OK**. The share will be removed from the DDE shares database and the displays in the **Custom DDE Security Browser** dialog will be updated.

Configuring the WinSock Interface

NetDDE Extensions for Microsoft Windows NT operating system allows viewing or configuring of the WinSock interface parameters without having to access the Windows NT Registry Editor.

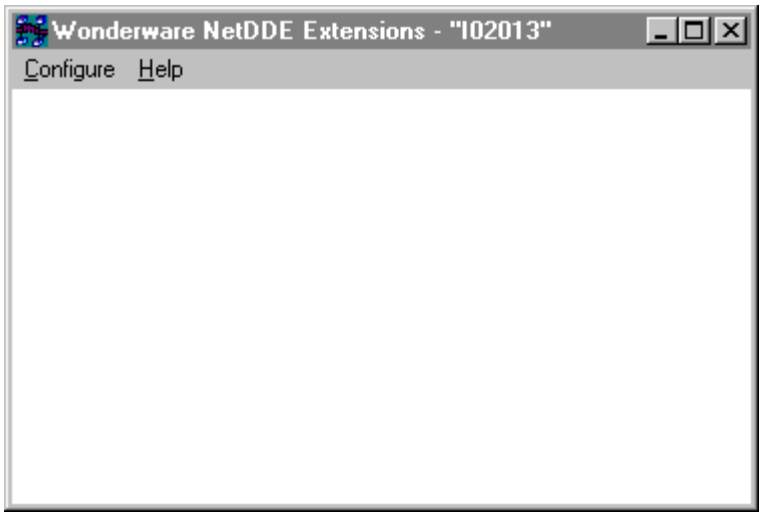
Installation Requirements for WinSock

Prior to installing Windows NT operating system and enabling its TCP/IP interface, a TCP/IP stack that conforms to the WinSock 1.1 standard must be installed.

To establish conversations between nodes, a network name and address must be defined for the local node and for each remote node(s).

Accessing the WinSock Interface Configurations

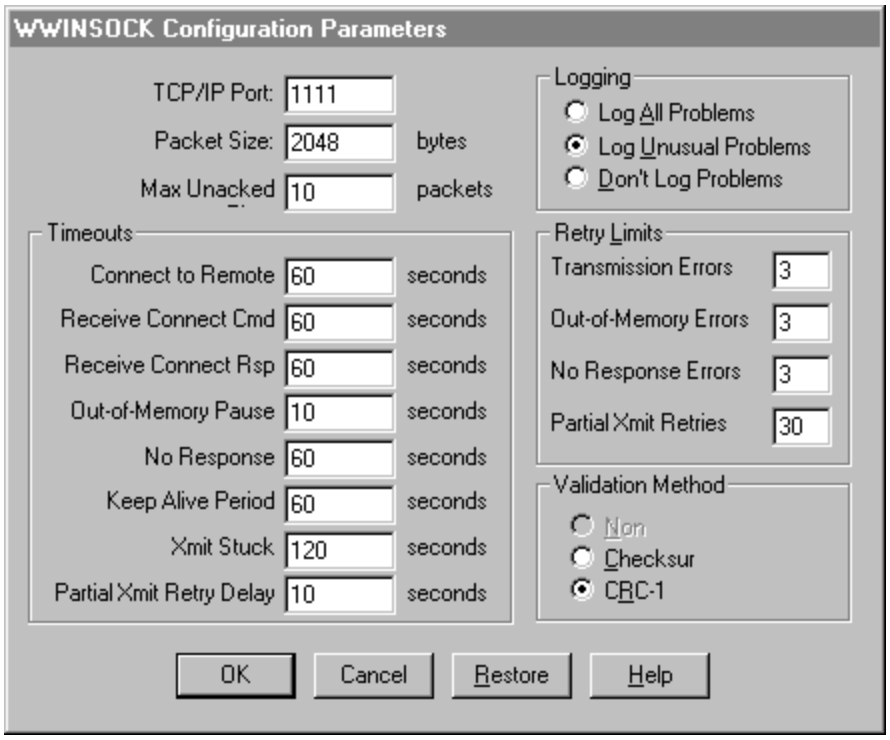
To access the WinSock network interface configurations, execute **NetDDE Extensions**. The **Wonderware NetDDE Extensions** dialog box will appear:



Configuring WWINSOCK

➢ **To configure WWINSOCK:**

1. On the **Configure** menu, double-click **WWINSOCK**. The **WWINSOCK Configuration Parameters** dialog box appears:



2. In the **TCP/IP Port** box, type the local port number used by TCP/IP when attempting to connect to a host. All hosts communicating with each other must have the same port number.

3. In the **Packet Size** box, type the size of network packets to be used over the WinSock network. The default value of 2048 bytes is optimal for most configurations.

4. In the **Max Unacked Pkts** box, type the number of unacknowledged packets the WinSock network interface will allow. During normal operation, the WinSock interface allows several unacknowledged network packets to be outstanding at the interface before pausing to wait for acknowledgment. If the values for this parameter are different at two connecting nodes, the minimum value will be used by the WinSock interface.

5. In the **Timeouts** group, type the timeout values (measured in seconds) for the WinSock interface:

   Connect to Remote — Type the number of seconds the WinSock network interface will wait before timing out on the connection.

   Receive Connect Cmd — Type the number of seconds the WinSock network interface will wait from the time of the initial connect to the time it receives an initial connect packet from the remote node.

Receive Connect Rsp Type the number of seconds the WinSock network interface will wait from the time it sends an initial connect packet to the time it receives an initial connect response packet from the remote node.

Out-of-Memory Pause Type the number of seconds the WinSock network interface will wait to re-transmit a message to the remote node after receiving notification the remote node is out of memory.

No Response Type the amount of time the WinSock network interface will wait for a transmitted packet to be acknowledged by the remote node before attempting to re-transmit the unacknowledged packet.

Keep Alive Period Enter the amount of time between keep-alive packets that are exchanged between connected Windows NT programs. Keep-alive packets are used as positive acknowledgment the connection is still functional in the absence of normal DDE message activity.

Xmit Stuck Enter the number of seconds the WinSock network interface will wait for permission from the network interface to transmit an outbound packet before timing out and closing the connection.

Partial Xmit Retry Delay Enter the number of seconds the WinSock network interface will wait before re-transmitting an unsuccessfully transmitted packet.

6. Select the **Logging** type that you want to use. These options provide the ability to control the amount of information the specific network interface will log to the WWINSOCK.LOG file located in the WINNT/SYSTEM32 directory. The following mutually exclusive options are available:

   Log All Problems Log all problems detected at the network interface.

   Log Unusual Problems Only log problems that are unusual for the network interface. This is the default option.

   Don't Log Problems Disable problem logging.

7. In the **Retry Limits** group, type the retry limits enforced by the WinSock network interface after the associated timeout expires:

   Connect to Remote Type the number of times the WinSock network interface will retry transmission of a specific packet to a remote node after that packet has been rejected by the remote node.

   Out-of-Memory Errors Type the number of times the WinSock network interface will retry transmission of a specific packet to a remote node after that node has requested that WinSock "back off" (due to low memory conditions).

   No Response Errors Type the number of times the WinSock network interface will retry transmission of a specific packet to a remote node without receiving any response from the remote node for that packet.

   Partial Xmit Retries Type the number of times the WinSock network interface will try to re-transmit an unsuccessfully transmitted packet before closing the connection.

8. Select the **Validation Method** type that will provide the ability to control data authentication performed on message packets.

None	Is not available in the WinSock interface configuration extension.
Checksum	This method uses a checksum (summing of message contents) to verify data integrity and is the default.
CRC-16	This method uses a 16-bit cyclic redundancy check to verify data integrity.

9. To restore the originally installed default values for all parameters, click **Restore**. Otherwise, click **OK** or **Cancel**.

WinSock Error Messages

Error messages for the WinSock network interface are logged to the WWINSOCK.LOG file located in the WINNT/SYSTEM32 directory. To view error messages from this file, open the file in a text editor, e.g., Notepad. Possible error messages include:

"AsyncWindowProc: WINSOCK_EVENT error WSAERRORCODE on socket SOCKET_NUMBER"
A WinSock message was received indicating an error has occurred for a specific asynchronous event.

"Changing the TCP/IP Port will require you to change on this every node in your system!
Are you sure you want to change this?"
This warning message states that changing the port number on the local host requires that all hosts which will connect to the local host will need to have matching port numbers to establish a connection.

"ConnectToHost: connect() failed, WSAERRORCODE"
The connect call to the specified host failed with the error specified by WSAERRORCODE.

"Copyright (c) 1993 Wonderware Software Development Corp. All rights reserved."
Informational copyright message.

"Local host HOST_NAME is not in the host table. Please add HOST_NAME to host table."
The local host name was not found in the host table. HOST_NAME is the NetDDE node name and must be entered in the host table for the WinSock interface to initialize properly.

"Maximum Sockets supported: *NNNNNN*"
Maximum number of sockets supported by the TCP/IP vendor's WinSock.

"NDDEAddConnection: bind() failed, error: ERROR_CODE"
Unable to bind a socket. The error code specifies the reason.

"NDDEAddConnection: connect() failed, error: ERROR_CODE"
Attempt to connect failed. The error code specifies the reason.

"NDDEAddConnection: socket() failed, error: WSAERRORCODE"
Unable to create a socket. The error code specifies the reason.

"NDDEAddConnection: Unknown host HOST_NAME. error: WSAERRORCODE"
Host name and address were not in the host table. Enter the host name and Internet address into the host table.

"NDDEShutDown: No listen was outstanding at shutdown."
No listen socket existed at shutdown. This is an internal anomaly which indicates the listen socket was destroyed before NetDDE shutdown.

"NODE_NAME not in host table. Please configure host table properly."
Specified node name was not found in the host table. Enter the host name and Internet address into the host table.

"ReceiveAllData: Receive Error = WSAERRORCODE, Socket = *NNNNN*, BufferSize = *NNNNN*"
A receive error occurred while trying to read data. The most common occurrence of this message is for a WSAEWOULDBLOCK. In this case, there is either inadequate buffer space or no data pending to be read. If the buffer is less than the NetDDE buffer size, then the buffer space for WinSock should be increased.

"SendData: Too many partial Tx retries on same packet: *NNN/NNN.NNN*"
Too many attempts were made to transmit the same packet. The connection will be closed.

"SetAsyncEvents: socket *NN*, hwnd *NNNN*"
A bad socket identifier or Async window handle was identified while setting asynchronous socket attributes. Internal application error.

"SetupListen: bind() failed. WSAERRORCODE"
Unable to bind the listen socket. The creation of listen socket failed during binding. The WSAERRORCODE specifies the WinSock error.

"SetupListen: listen() failed. ERROR_CODE"
Unable to create the listen socket. The creation of listen socket failed during the initialization. The WSAERRORCODE specifies the WinSock error.

"SetupListen: socket() failed. WSAERRORCODE"
Unable to create the listen socket. The creation of listen socket failed during the establishment of the socket. The WSAERRORCODE specifies the WinSock error.

"Unable to resolve address for host HOST_NAME. error: WSAERRORCODE"
WinSock was unable to resolve the hostname. Verify the host name is in the host table or if a DNS is being used, the DNS is reachable, and the host name exists.

"WinSock initialization error: ERROR_CODE"
WinSock initialization error in WSAStartup. WinSock internal error. WWinSock initialization will fail.

"WSAAsyncGetHostByName failed: WSAERRORCODE"
WinSock was unable to resolve the host name because the function which retrieves the host name reported an error. Verify the host name is in the host table. Or, if a DNS is being used, verify the DNS is reachable and the host name exists.

"WWINSOCK v*N.NN*... Node NODE_NAME"
Informational message providing WinSock version number and node name.

If the 'LogAll' Option is Selected:

"NDDETimeSlice: Closing Connection to host HOST_NAME on socket *NNNNN*"
Informational message stating that WinSock is closing a connection.

"SendData: Connection closed while trying to send"
WinSock received a close indication while trying to send data. The connection will be closed.

"SendData: *NN* partial Tx retries on same packet: *NN/NN.NN NN*"
Informational message stating that a packet has been partially transmitted *N* number of times.

"WINSOCK_VENDOR_TEXT"
WinSock vendor provided text. WinSock receives this text as part of its WinSock initialization procedure.

If the 'LogUnusual' Option is Selected:

"AcceptConnection: accept() failed, error: ERROR_CODE"
An attempt to accept a connection from another host failed. The error code specifies the reason.

"Changes take effect next time NetDDE is run"
For the WinSock configuration parameters that were changed to take effect, NetDDE will have to be closed and reopened.

"CreateAsyncWindow: CreateAsyncWindow failed"
WinSock was unable to create its Async window. WinSock initialization will fail.

"CreateAsyncWindow: Register failed."
WinSock was unable to register its window class. WinSock initialization will fail.

"NODE_NAME: Verify Error, closing connection"
A validation error on a packet occurred in the message header or message data. The connection will be closed.

"SendData: Retxmt required. WSAERRORCODE"
An unusual error occurred which requires retransmission of a packet. The error code specifies the reason.

"SendData: send() failed, error: WSAERRORCODE"
A packet was unsuccessfully sent, with the error code specifying the reason. The packet will be resent.

"SetAsyncEvents() Failed"
WinSock was unable to properly initialize the new socket with asynchronous attributes.

Low-Level Interface Logging:

The following ERROR_CODEs are returned by the low-level WinSock interface in response to various commands.

WSAEACCES
Permission denied.

WSAEADDRINUSE
The specified address is already in use. (See the SO_REUSEADDR socket option under setsockopt().)

WSAEADDRNOTAVAIL
The specified address is not available from the local machine.

WSAEAFNOSUPPORT
The specified address family is not supported by this protocol.

WSAEBADF
Bad file number.

WSAECONNABORTED
The virtual circuit was aborted due to timeout or other failure.

WSAECONNREFUSED
The attempt to connect was forcefully rejected.

WSAECONNRESET
The virtual circuit was reset by the remote side.

WSAEDESTADDRREQ
A destination address is required.

WSAEFAULT
The *addrlen* argument is too small (less than the size of a struct sockaddr).

WSAEHOSTDOWN
The host is down.

WSAEHOSTUNREACH
Unable to connect to specified host.

WSAEINPROGRESS
A blocking Windows Sockets call is in progress.

WSAEINTR
The (blocking) call was canceled via WSACancelBlockingCall().

WSAEINVAL
listen() was not invoked before an accept().

WSAEISCONN
The socket is already connected.

WSAELOOP
An illegal loopback operation.

WSAEMFILE
The queue is empty upon entry to accept() and there are no descriptors available.

WSAEMSGSIZE
The datagram was too large to fit into the specified buffer and was truncated.

WSAENAMETOOLONG
The specified name is too long.

WSAENETDOWN
The Windows Sockets implementation has detected the network subsystem has failed.

WSAENETRESET
The connection must be reset because the Windows Sockets implementation dropped it.

WSAENETUNREACH
The network can't be reached from this host at this time.

WSAENOBUFS
No buffer space is available.

WSAENOPROTOOPT
The option is unknown or unsupported. In particular, SO_BROADCAST is not supported on sockets of type SOCK_STREAM, while SO_ACCEPTCONN, SO_DONTLINGER, SO_KEEPALIVE, SO_LINGER and SO_OOBINLINE are not supported on sockets of type SOCK_DGRAM.

WSAENOTCONN
The socket is not connected (SOCK_STREAM only).

WSAENOTSOCK
The descriptor is not a socket.

WSAEOPNOTSUPP
The referenced socket is not a type that supports connection-oriented service.

WSAEPFNOSUPPORT
Protocol format not available.

WSAEPROTONOSUPPORT
Protocol not supported.

WSAEPROTOTYPE
The specified protocol is the wrong type for this socket.

WSAESHUTDOWN
The socket has been shutdown; it is not possible to sendto() on a socket after shutdown() has been invoked with how set to 1 or 2.

WSAESOCKTNOSUPPORT
Socket type not supported.

WSAETIMEDOUT
The attempt to connect timed out without establishing a connection

WSAETOOMANYREFS
Too many references.

WSAEWOULDBLOCK
The socket is marked as non-blocking and no connections are present to be accepted.

NetDDE Helper Service

The NetDDE Helper service (WWNETDDE.EXE) is designed to maintain connectivity between NetDDE conversations by performing two main functions:

- Ensures that the shares remain available as different users log on and off.
- Hooks the DDE agent so that client-side DDE conversations are not terminated when a user logs off.

The NetDDE Helper service shares the NetDDE shares so that remote computers can access them. These shares are established under the authentication of the "master" FactorySuite user account that is specified during common component installation. Details for the FactorySuite user account are encrypted and stored in the Windows NT Registry.

The Wonderware NetDDE Helper service is set up to use the System account and be interactive. This account does not have permissions to establish network shares. Therefore, when the service starts up, it uses the FactorySuite user account to establish the shares.

For more information on setting up the FactorySuite user account during installation, see Chapter 3, "Installation." For more information on the master FactorySuite user account, see Chapter 10, "Security."

Services as NetDDE Clients

Any service that will function as a NetDDE client must be configured to:

- Start up using the System user account and interact with the desktop.

  To configure this, use the Services program in Control Panel.

- Impersonate a user using the FactorySuite user account before starting the DDE conversation.

SuiteLink

Wonderware FactorySuite is shipped with Wonderware's communications protocol SuiteLink. Wonderware SuiteLink uses a TCP/IP based protocol. SuiteLink is designed specifically to meet industrial needs, such as data integrity, high-throughput, and easier diagnostics. This protocol standard is only supported on Microsoft Windows NT 4.0 or higher.

SuiteLink is not a replacement for DDE, FastDDE, or NetDDE. Each connection between a client and a server depends on your network situation. SuiteLink was designed specifically for high speed industrial applications and provides the following features:

- Value Time Quality (VTQ) places a time-stamp and quality indicator on all data values delivered to VTQ-aware clients.
- Extensive diagnostics of the data throughput, the server loading, computer resource consumption, and network transport are made accessible through the Microsoft Windows NT operating system performance monitor. This feature is critical for the scheme and maintenance of distributed industrial networks.
- Consistent high data volumes can be maintained between applications regardless if the applications are on a single node or distributed over a large node count.
- The network transport protocol is TCP/IP using Microsoft's standard WinSock interface.

Note You do not have to create shares for SuiteLink I/O Servers.

Time-stamping

SuiteLink allows for the passing of time-stamping information with process data. The SuiteLink time-stamp is a 64-bit data structure representing the number of 100-nanosecond intervals since January 1, 1601 in Greenwich Mean Time. This matches the Microsoft FILETIME specification. Conversion to and from local time is the responsibility of the application layer. All time-stamps carried in the SuiteLink protocol are in GMT.

Quality

When a data value is acquired by a Wonderware I/O Server using SuiteLink, a 2-byte quality flag is assigned to the value. This flag represents the quality state for an item's data value. The lower eight bits of the quality flag consists of three bit fields: Quality (Q), Substatus (S), and Limit (L). (The high eight bits are undefined.) These three bit fields are arranged as follows:

QQSSSSLL

The bit assignments in these two bytes complies fully with the OPC specification for data quality. Each of these bit fields is described in the following table:

Bit Field	Description
Quality	Determines the status of the data value. Data values can be bad (0), uncertain (1), or good (3). A server that supports no quality information must return 3 (Good). It is also acceptable for a server to simply return Bad or Good (0 or 3) and to always return 0 for substatus and limit.

Substatus	Used to further describe the overall quality of the value. For example, if the quality for a particular value is bad, then the Substatus field carries a number associated with a reason that the value was bad, such as a device failure or a configuration error. Servers that do not support substatus should return 0. Note that an 'old' value may be returned with the Quality set to BAD (0) and the substatus set to 5. This is for consistency with the Fieldbus Specification.
Limit	Returns information on the limits of the value. For example: Is it clamped at a high limit? The Limit bit field is valid regardless of the Quality and Substatus. In some cases such as Sensor Failure it can provide useful diagnostic information.

Quality Bit Field

The following table describes the data quality values for the Quality bit field.

Value	Quality	Description
0	Bad	Value is not useful for reasons indicated by the substatus.
1	Uncertain	The quality of the value is uncertain for reasons indicated by the substatus.
2	N/A	Not used by OPC
3	Good	The Quality of the value is Good.

Substatus Bit Field

The layout of this field depends on the value of the Quality bit field. The following table describes the "Bad" quality values for the substatus bit field.

Value	Quality	Description
0	Non-specific	The value is bad but no specific reason is known
1	Configuration Error	There is some server specific problem with the configuration. For example the item is question has been deleted from the configuration.
2	Not Connected	The input is required to be logically connected to something but is not.
3	Device Failure	A device failure has been detected
4	Sensor Failure	A sensor failure had been detected (the 'Limits' field can provide additional diagnostic information in some situations.)
5	Last Known Value	Communications have failed. However, the last known value is available. Note that the 'age' of the value can be determined from the OPCITEMSTATE.
6	Comm Failure	Communications have failed. There is no last known value is available.
7	Out of Service	The block is off scan or otherwise locked (e.g. by a configuration builder).
8-15	N/A	Not used by WW/OPC

The following table describes the "Uncertain" quality values for the substatus bit field.

Value	Quality	Description
0	Non-specific	There is no specific reason why the value is uncertain.
1	Last Usable Value	Whatever was writing this value has stopped doing so. The returned value should be regarded as 'stale'. Note that this differs from a BAD value with substatus 5 (Last Known Value). That status is associated specifically with a detectable communications error on a 'fetched' value. This error is associated with the failure of some external source to 'put' something into the value within an acceptable period of time. Note that the 'age' of the value can be determined from the OPCITEMSTATE.
2-3	N/A	Not used by OPC
4	Sensor Not Accurate	Either the value has 'pegged' at one of the sensor limits (in which case the limit field should be set to 1 or 2) or the sensor is otherwise known to be out of calibration via some form of internal diagnostics (in which case the limit field should be 0).
5	Engineering Units Exceeded	The returned value is outside the limits defined for this parameter. Note that in this case (per the Fieldbus Specification) the 'Limits' field indicates which limit has been exceeded but does NOT necessarily imply that the value cannot move farther out of range.
6	Sub-Normal	The value is derived from multiple sources and has less than the required number of Good sources.
7-15	N/A	Not used by WW/OPC

The following table describes the "Good" quality values for the substatus bit field.

Value	Quality	Description
0	Non-specific	The value is good. There are no special conditions
1-5	N/A	Not used by WW/OPC
6	Local Override	The value has been Overridden. Typically this is means the input has been disconnected and a manually entered value has been 'forced'.
7-15	N/A	Not used by WW/OPC

Limit Bit Field

The following table describes the data quality values for the Limit bit field.

Note The Limit bit field is valid regardless of the Quality and Substatus. In some cases, such as Sensor Failure, it can provide useful diagnostic information.

Value	Quality	Description
0	Not Limited	The value is free to move up or down
1	Low Limited	The value has "clamped" at some lower limit
2	High Limited	The value has "clamped" at some high limit.
3	Constant	The value is a constant and cannot move.

Wonderware I/O Server Quality Reporting

Wonderware I/O Servers can report six mutually exclusive states of quality of data being sent back to their clients. They are as follows:

1. Good
2. Clamped High
3. Clamped Low
4. Cannot Convert
5. Cannot Access Point
6. Communications Failed

The conditions under which each of these quality states will be reported are described in the following sections.

Good

In order for the "Good" quality state to be reported, the following must occur:

- The communications link was verified.
- The PLC understood the poll request and returned a valid response packet.
- If a write occurred, there were no errors during the write process.
- There were no conversion problems with the data contained in the response packet.

The I/O Server returns a value of 0x00C0 for the Good quality state.

Clamped High

The "Clamped High" quality state will be reported if it was necessary to clamp the intended value to a limit because the value was larger that the maximum allowed.

The communications link was verified, and the PLC understood the poll request and returned a valid response packet. The register was read or written without error.

Note In the case of a string, it is truncated.

The I/O Server returns a value of 0x0056 for the Clamped High quality state.

Clamped Low

The "Clamped Low" quality state will be reported if it was necessary to clamp the intended value to a limit because the value was smaller that the minimum allowed.

The communications link was verified, and the PLC understood the poll request and returned a valid response packet. The register was read or written without error.

The I/O Server returns a value of 0x0055 for the Clamped Low quality state.

Cannot Convert

The "Cannot Convert" quality state will be reported if a conversion error occurs. The communications link was verified, and the PLC understood the poll request and returned a valid response packet. Causes for conversion errors include, but are not limited to:

- The data from the PLC could not be converted into the desired format.
- The server may return a constant in place of the data, or return quality information alone.
- The data is not usable.
- It is not known whether the value is too large or too small.
- The data returned from the PLC is of the incorrect data type.
- A floating-point number is returned, but is not a value (that is, it is not a number).

The I/O Server returns a value of 0x0040 for the Cannot Convert quality state.

Cannot Access Point

The "Cannot Access Point" quality state occurs if the PLC reported that it could not access the requested point or that the data is not usable. The communications link was verified, and the PLC understood the poll request and returned a valid response packet. Possibilities for lack of accessibility include, but are not limited to:

- The item does not exist in PLC memory.
- The item is not currently available (locked in some way due to resource contention).
- The item is not of the correct format/data type.
- A write attempt was made, but the item is read-only.

In most cases, a group of items will be affected when one item is invalid. This is due to the block-polling scheme used by servers. For example, if one item in a block of 10 is invalid, then the entire block is marked invalid by the PLC. The server will report invalid quality for all items in the block.

The I/O Server returns a value of 0x0004 for the Cannot Access Point quality state.

Communications Failed

The "Communications Failed" quality state will be reported if any one of the following occurs:

- Data communications are down.
- The topic is in slow poll (or equivalent) mode.
- There have been no link validating messages.
- Lack of resources in the server (for example, a TSR or driver cannot allocate memory).
- Lack of resources in the communications link.
- The communications link is off-line.
- All communications channels are in use.
- The network is unable to route the message to the PLC.

The I/O Server returns a value of 0x0018 for the Communications Failed quality state.

OLE for Process Control (OPC)

OLE for Process Control (OPC) is a standard set of interfaces, properties, and methods that extend Microsoft's OLE (Object Linking and Embedding) and COM (Component Object Model) technologies for use in process control applications. The implementation of OPC for Wonderware FactorySuite consists of two parts:

- Wonderware OPCLink Server, which is a SuiteLink/FastDDE/DDE to OPC gateway for all Wonderware clients that need to communicate with an OPC Server.
- Wonderware OPC Browser, which is used from within InTouch WindowMaker to browse registered OPC Servers on the network and automatically generate new InTouch tags linked to OPC items. In order for the OPC Browser to see an OPC Server, the OPC Server must be registered on your machine.

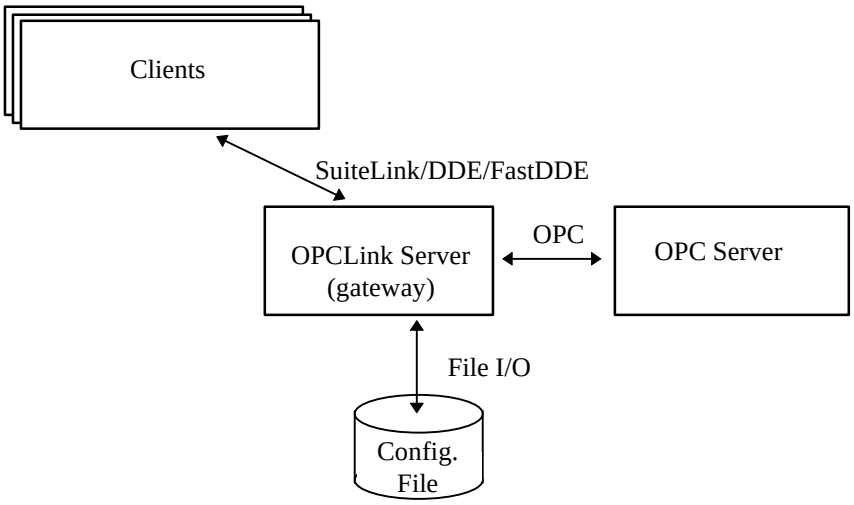
OPCLink Server

The OPCLink Server connects all Wonderware products to OPC. It connects locally or remotely to any OPC Server and transfers data via DDE, FastDDE, and SuiteLink to any local or remote client. The OPCLink Server maps all client requests to OPC requests for data acquisition. The OPCLink Server also allows you to browse through the address spaces of OPC Servers that have the browser interface implemented. The OPCLink Server contains a topic editor for use with FactorySuite components other than InTouch.

The advantages of using OPCLink versus a direct integration of OPC into the Wonderware products are superior network capabilities of SuiteLink versus DCOM; additional diagnostic and monitoring features; and connectivity to OPC on non-NT platforms. Using the OPCLink Server, you can:

- Display and edit the topic configuration stored in the configuration file of the OPC Server.
- Map DDE/SuiteLink toolkit calls to OPC calls.
- Map item values, time stamp and data quality.
- Edit topics.
- Load and save configuration files.
- Browse items in selected OPC Servers.
- Monitor item states.

The following is a diagram of the network connections:



The preferred setup is to install the OPCLink Server on every system that has an OPC Server and connect them locally via COM. Clients can then use the superior network capabilities of SuiteLink to connect to the OPCLink Server.

The configuration file can be created by either the OPCLink Server or by the OPC Browser in InTouch WindowMaker. If the OPCLink Server is not on the same computer as the client, the InTouch WindowMaker will access it through remote file I/O.

📖 For more information on using the OPCLink Server, see your *OPCLink Server User's Guide*.

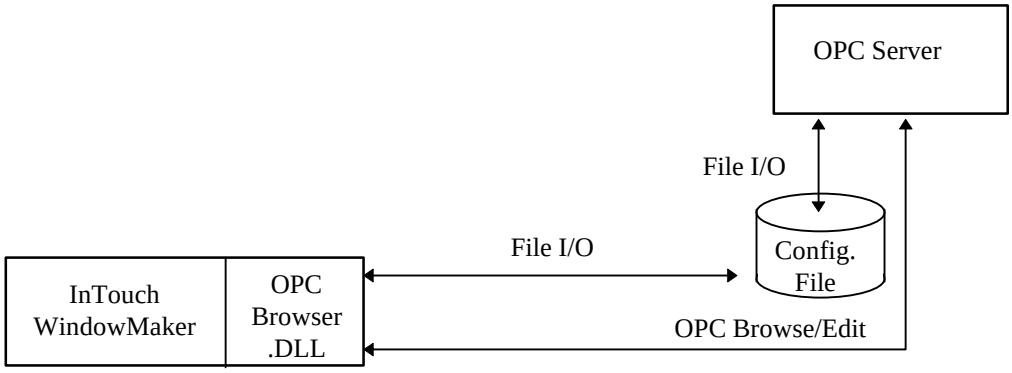
OPC Browser

The Wonderware OPC Browser is an interface for WindowMaker that allows you to:

- Select registered local and remote OPC Servers.
- Browse through the address spaces of any OPC Server that exposes its OPC item names through the interface.
- Generate tags and access names
- Configure local and remote Wonderware OPCLink Servers.

The OPC Browser is implemented as a module (.DLL) for InTouch WindowMaker (version 7.0 or later). You can map selected OPC items to InTouch access names and tags and configure the Wonderware OPCLink Server.

The following is a diagram of the network connections for use within InTouch:



📖 For more information on using the OPC Browser, see your *OPCLink Server User's Guide*.

CHAPTER 6

FactorySuite Common Components

This chapter describes the FactorySuite common components.

Contents

Common Components

This chapter describes the common components of the FactorySuite. When any product in the FactorySuite is installed, files for these components are automatically installed in the Common directory of the FactorySuite program group. Some of these common components have visible user-interfaces, while others work "behind the scenes" to facilitate integration.

The following table lists the common components used by the products of the FactorySuite.

	IT	InSQL Server	InSQL Client	IC	IB Server	IB Client	IB Cntl \ Ext	ITR	Scout VT	Scout OP	I/O Servers	Prod. Pack
License Utility	X	X	X	X	X	X	X	X			X	
Adobe Acrobat Reader	X	X	X	X	X	X	X	X			X	X
Doc Viewer								X				X
Wonderware Logger	X	X		X	X	X	X	X	X		X	
Common Documentation	X	X	X	X	X	X	X	X			X	X
SQL Server Client Tools	X	X	X		X			X				
ODBC	X		X		X	X	X	X				X
NetDDE Extensions	X	X		X	X	X					X	
SuiteLink	X	X		X	X						X	
Crystal Reports Runtime					X	X		X				
Borland BDE		X	X									
Common Files												
MFC Files	X	X	X	X	X	X	X	X	X	X	X	X
DLL, BMP, etc.	X	X	X	X	X	X	X	X	X	X	X	X

Key:

IT = InTouch
InSQL Server = IndustrialSQL Server
InSQL Client = IndustrialSQL Clients
IC = InControl
IB Server = InBatch Server
IB Client = InBatch Client
IB Cntl\Ext = InBatch Cntl\Ext
ITR = InTrack
Scout VT = Scout VT
Scout OP = Scout Outpost
Prod. Pack = Productivity Pack

Note The Rainbow Sentinel-C driver is installed and deployed for support for hardware key licensing.

Master Installation Program

All products in the FactorySuite are installed beginning with a "master" install program, which contains installation options that are common to all products, such as the license agreement and product registration. When you select a FactorySuite product at the end of the master install, that product's installation program will automatically start up. The master install program is on each CD and will automatically start up when the FactorySuite CD is inserted into your CD-ROM drive.

The master installation program is used by I/O Servers, InTouch, InTrack, InBatch, IndustrialSQL Server, and InControl.

For more information, see Chapter 3, "Installation," in this administrator's guide.

License Utility

To install a license file, you must use the License Utility program that is provided as a utility for all FactorySuite components. If you install a FactorySuite component, you will automatically get the License Utility. A program icon for the License Utility is created in the Common group of the FactorySuite program group. The License Utility is also included on a license file diskette.

Once you have installed a license, you can view the license(s) on the network using the License Utility.

The License Manager provides clients, or consumers, a complete API through which secure Wonderware issued licenses can be accessed. The License Manager does the work of ensuring that the correct FactorySuite component functionality is enabled per the license file.

For more information, see Chapter 7, "Licensing," in this administrator's guide.

Wonderware Logger

The Wonderware Logger records information regarding the activity performed on the computer. For example, start up data, error conditions, I/O Server information and so on. When you are running a Wonderware FactorySuite component, you should always have the Wonderware Logger running.

The Wonderware Logger is composed of two components: the user interface and the logging process.

- The user interface (WWLOGVWR.EXE) is an application by which a user can view error and informational messages that are sent by FactorySuite components. You can customize the behavior of the logging process (format of the displayed lines, location of the log file, and so on) through this application.
- The logging process (WWLOGSVC.EXE) is a task that runs in the background and actually does the work of processing incoming messages and sending them to the application component to be displayed. It also formats and writes text lines to the log file. The logging process behaves differently when it is run on the Windows 95 operating system than when it is run on the Windows NT operating system.

Note When running any Wonderware software, it is recommended that the Wonderware Logger **always** be running in the background. If a problem occurs with an application, always check the Wonderware Logger for error messages **prior** to calling Technical Support.

The Wonderware Logger is used by I/O Servers, InTouch, InTrack, InBatch, IndustrialSQL Server, InControl, and Scout. When it is installed, a program icon is created in the Common group of the FactorySuite program group.

For more information on the Wonderware Logger, see Chapter 9, "Maintenance and Diagnostics," in this administrator's guide.

DDE, FastDDE, NetDDE, and SuiteLink

DDE is the acronym for Dynamic Data Exchange. DDE is an interprocess communications protocol designed by Microsoft to allow applications in the Windows environment to send/receive data and instructions to/from each other. Wonderware FastDDE is an implementation that provides a means of packing many proprietary Wonderware DDE messages into a single Microsoft DDE message. Wonderware's NetDDE extends the standard DDE (Dynamic Data Exchange) functionality to include communication over local area networks and through serial ports.

SuiteLink is an interprocess communications protocol designed by Wonderware to provide reliable data delivery with the capability to transport Value, Time, and Quality information at the lowest level (item-level VTQ).

DDE, FastDDE, NetDDE, and SuiteLink are supported by InTouch, InBatch, IndustrialSQL, InControl, and Scout.

For more information on DDE, FastDDE, NetDDE, and SuiteLink, see Chapter 5, "Protocols," in this administrator's guide.

Crystal Reports

The Crystal Reports Reporting Engine is a third-party application used for creating reports from data in ODBC-compliant databases.

Crystal Reports can be used to retrieve data from the IndustrialSQL Server, as well as SQL Server databases used with InTrack or InBatch.

For more information on using Crystal Reports with IndustrialSQL Server, see your *IndustrialSQL Server Client Tools Guide*. For more information on using Crystal Reports with a typical SQL Server database, see the Crystal Reports documentation.

Doc Viewer

The Document Viewing Application is a third-party application used for viewing various types of documents from within InTrack or InTouch.

Adobe Acrobat Reader

All of the FactorySuite component documentation is distributed in the form of Adobe Acrobat .PDF files. The Adobe Acrobat Reader is a third-party application that enables you to view, search, and copy information in a .PDF file.

For more information, see Appendix A, "For More Information," in this administrator's guide.

Common Documentation

Common documentation for the FactorySuite consists of this *FactorySuite Administrator's Guide* and the *NetDDE for the Microsoft Windows Operating System User's Guide*.

For more information on the various guides for components of the FactorySuite, see "For More Information," in this administrator's guide.

Common User-Interface Elements

I/O Servers, InTouch, InTrack, InBatch, IndustrialSQL Server, InControl, and Scout all use the common user-interface elements, such as:

- The **About** dialog box, which is accessible from the **Help** menu of each program.
- Toolbar buttons and icons.
- Splash screens.

In addition, FactorySuite components incorporate application features of the Windows 95/Windows NT 4.0 user interface, such right mouse button pop-up menus, floating/docking toolbars, tabbed dialogs, and support for long file and directory names.

SQL Server Client Tools

If no Microsoft SQL Server client utilities are detected, the FactorySuite master installation program will install them. Microsoft ISQL/w, SQL Enterprise Manager, and the SQL Client Configuration Utility will be installed.

ODBC

The Microsoft ODBC API provides a universal data access interface to a variety of client/server and mainframe databases. An application written for the ODBC API can be used to access any database management system, given the appropriate ODBC drivers. The following FactorySuite components use ODBC to transfer database information across the network to client applications: IndustrialSQL Server and clients, InBatch Server and clients, and InTouch.

For more information on configuring ODBC for use with FactorySuite components, see Chapter 4, "Component Networking Options."

Borland Database Engine (BDE)

The Borland Database Engine (BDE) connectivity software must be installed on each computer that will run InTouch or an IndustrialSQL Server client program. If BDE is not currently installed on the client computer, the master installation program will automatically install these files. If BDE is installed, the installation program will prompt you to overwrite the existing copy.

Note If you install Crystal Reports separately (using the Crystal Reports installation program) after installing InTouch, IndustrialSQL Server, or IndustrialSQL clients, any BDE files will automatically be overwritten with older versions. Reinstall InTouch or IndustrialSQL Server to install the newer versions.

CHAPTER 7

Licensing

This chapter describes the FactorySuite licensing strategy and explains how to use the License Utility to install license files and browse valid license files on the network.

Contents

Overview of FactorySuite 2000 Licensing

The Wonderware FactorySuite 2000 release consists of multiple software components. The Wonderware License Agreement grants you the right to use and display the software on a single computer at a single address location. In addition, Wonderware provides several types of enforcement mechanisms to license and enable specific software programs. The goal of FactorySuite 2000 licensing is to further simplify how licensing is implemented for Wonderware products. The FactorySuite license management system is designed to work with or without a hardware key (dongle). Upon validation of the licensing information, the appropriate FactorySuite 2000 component will be activated.

WWSUITE.LIC License File

For FactorySuite 2000, licensing is enforced for all Wonderware products through the use of a single license file, WWSUITE.LIC. When you buy a Wonderware product, customer information, product data and functionality, the serial number, and so on is included in this license file.

The WWSUITE.LIC license file is distributed on a floppy diskette. You must install the license file using the FactorySuite 2000 License Utility. This utility can also be used to view the details of the license file.

In order to view or manage license files, you must have administrative rights for the folder(s) in which the license files reside. For example, if you want install a license file in a folder on a network computer, your network user account must have administrative rights for that folder. This provides a level of security since only the network administrator or someone with similar rights can manage FactorySuite licensing.

Feature Lines and Components

A feature line represents enabled functionality for a Wonderware software program. For example, the INBATCH_DEVELOPMENT_CLIENT feature line enables InBatch remote development functionality.

A FactorySuite component is a set of one or more feature lines that are licensed for use on a computer. For example, you could buy the InTrack Runtime Module for InTouch or a Level 2 InBatch Server (which includes IndustrialSQL Server). Each FactorySuite component is assigned a unique part number.

Once you have installed the WWSUITE.LIC license file, you can move components from one computer to another using the License Utility.

Note After installation, the source license file (the one on the floppy) retains its components. After a component move, the source license file will no longer contain the component. For example, if you move a Component X from Computer A to Computer B, Computer A will lose the component, while Computer B will gain it.

Installing Multiple License Files on a Single Computer

The License Utility allows you to install multiple products on a single computer. The License Utility equates a product as a component line with its associated feature lines in the license file. For example, you buy InTouch and install its WWSUITE.LIC license file. Later, you buy InControl and install its WWSUITE.LIC license file on the same computer. The License Utility will append the contents of the InControl WWSUITE.LIC license file to the existing InTouch WWSUITE.LIC license file. This would allow you to run both products on the single computer. If you later wanted to run the products on separate computers, you would delete the InControl component and then install the InControl license file on another computer.

If you attempt to install a component to a license file that already contains the same component, then the License Utility will ask whether you wish to overwrite or abort the installation.

There are some instances in which it is possible to have multiple components that contain the same feature line. In these cases, the functionality for the first feature line listed in the license file is used. For example, you buy FactorySuite and install the license file that enables it. You then buy a later version of InTouch (which supports more tags) and, using the License Utility, append its license file to your existing license file. You now have a license that contains two InTouch features lines: one for FactorySuite and one for the later version of InTouch. When InTouch is started, it will read the InTouch feature line for the FactorySuite to determine functionality, since it is listed first. To correct this, delete or move the FactorySuite license file, install the newer InTouch license file, and then append the FactorySuite license file to the InTouch license file.

Serial Numbers

A serial number is a unique number that is associated with the purchase of a license by a customer. Each WWSUITE.LIC license file that is distributed on floppy disk includes this serial number. You can view the serial number using the License Utility.

Products that are licensed via a paper license do not have a license file, but are still assigned a unique serial number. These products include Scout, IndustrialSQL Server Client Access License (CAL), and the FactorySuite Toolkit. Customer information, product description, and the serial number appear on a label that accompanies the product.

Version Enforcement

All components in FactorySuite 2000 will be version 7.0, except for some of the I/O Servers. The version number can be viewed using the License Utility and is listed on label of the floppy diskette on which the FactorySuite 2000 license file is distributed.

When an installed FactorySuite component starts up, the license file will be checked to ensure that the current version is licensed for use. If the component version and the licensed version are not the same, the component will default to either an invalid or absent license mode.

Hardware Key Support

The Sentinel-C and SuperPro type hardware keys (dongles) will be supported for FactorySuite 2000. The single license file that you will receive with FactorySuite 2000 will be "locked," or permanently associated with, the hardware key serial number. All hardware keys issued by Wonderware have a unique serial number. The serial number for the hardware key is matched to the license file with an authentication algorithm. Both the license file and the hardware key must be installed on the same computer in order to run the FactorySuite component. Simply install the FactorySuite component, then the license file. Attach the hardware key to the computer's parallel port.

Component Behavior Under Various License Situations

The various licensing situations and the expected component behavior is identified in the following table:

Mode	Component Behavior
Valid license	Normal operations as constrained by license.
Invalid or absent license	Enters a demonstration mode, if applicable. The demonstration mode may consist of a subset of product functionality. The user will be notified upon start up that a license was not detected, and that the system is running in demonstration mode. The demonstration mode will expire after 2 hours (120 minutes).
License expiration	Continue normal runtime operations, except for IndustrialSQL Server. IndustrialSQL Server will shut down in an orderly fashion, stopping and disabling the Microsoft SQL Server, if it was installed during the IndustrialSQL Server installation.
License failure (a valid license becomes invalid during runtime)	Continue normal runtime operations. The operator will be alerted to the situation and an appropriate error message will be logged. When the system is restarted, it will operate in the "Invalid or Absent License" mode.

Note To install ActiveX controls, you must have a valid license file installed.

The following table summarizes component behavior in each of these licensing situations:

Component	Invalid or Absent License	License Expiration	License Failure
InBatch	Will not start	Normal operations	Normal operations
InControl*	24-hour demo mode	7-day demo mode	7-day demo mode
IndustrialSQL Server	120-minute demo mode	Shuts down, stopping and disabling MS SQL Server	Normal operations
InTouch	120-minute demo mode	Normal operations	Normal operations
InTrack	Will not start	Normal operations	Normal operations
I/O Servers	120-minute demo mode	Normal operations	Normal operations
Scout Outpost	N/A	N/A	N/A

* Will only run in 24-hour demo mode a license file was never installed. The 24-hour demo mode includes full operation with some I/O restrictions. The 7-day demo mode is more like a restricted mode. It does not allow the program to be edited, but will continue to run until the user resolves the license issues.

Using the License Utility

The License Utility is used to track (locate and view license files both on the local computer and remote computers) and count license files. The License Utility is also used to install license files locally and remotely and to move components from one license file to another.

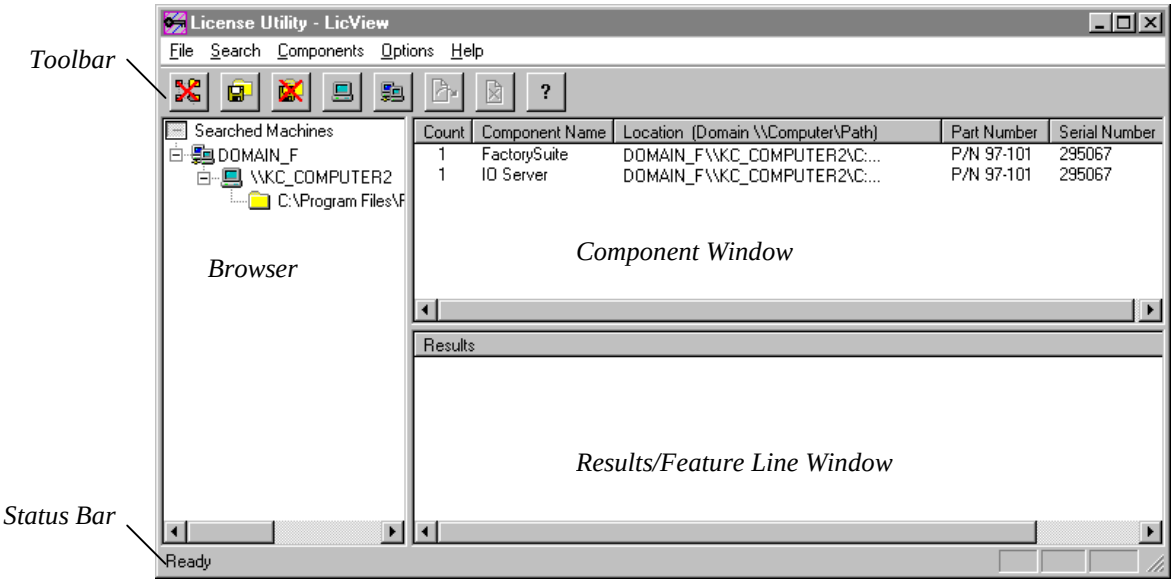
License installation and configuration should only be done by a network administrator. You can only view and/or move licenses that are located in folders for which you have administrative rights. Using the License Utility, you can:

- Track FactorySuite 2000 licenses.
- From a remote location, inspect the network for license files and indicate the locations and total count of each license for an installed product.
- Move license files from one computer to another.
- Move one or more components in a license file to another license file.
- Install license files.

Note The License Utility that is shipped with FactorySuite 2000 can only manage licenses for FactorySuite 2000 components; use the FactorySuite 1000 License Viewer to track FactorySuite 1000 licenses.

➢ **To start the License Utility:**

1. Install the product(s) from the FactorySuite CD or over the network.
2. Start the License Utility by doing any of the following:
   - Insert the license diskette into your floppy drive. From the **Start** menu on the Windows Taskbar, click **Run**. In the dialog box, type **a:\install**.
   - From the **Start** menu on the Windows Taskbar, point to **Programs**, **Wonderware FactorySuite**, then to **Common**, and then click **License Utility**.
   - Launch the License Utility from any FactorySuite application by clicking the **About** command on the **Help** menu and then clicking the **View License** button.
3. The License Utility main window appears.



To exit the License Utility, click **Exit** from the **File** menu.

Toolbar

The main toolbar appears beneath the menu bar. Use the buttons on the main toolbar to execute commonly used menu commands.

The toolbar buttons are described in the table below:

Button	Used To
	Clear the browser of searched computers.
	Install a license file.
	Delete a license file.
	Search the network for computers with license files.
	Move a selected component.
	Delete a selected component.
	Search a computer for license files.
	Display the online Help.

Browser

The browser appears at the left side of the License Utility. You can navigate in the browser as you would any typical Windows based browsing application. Upon program initialization, the browser will display the local machine, as well as the paths to any local license files.

Component Window

The component window lists the components for all license files found on the computers that currently appear in the browser. The component window has six columns, which are described in the following table.

Column	Description
Count	Enumeration of the components found.
Component Name	Name of the component.
Location	Path to the license file using the Universal Naming Convention (UNC) format.
Part Number	Part number for the FactorySuite component.
Serial Number	Serial number as read from the license file.

If you select a component in the component window, all of the feature lines for that component will be displayed in the results window.

Results Window

The results window displays the feature lines for the component that is selected in the component window. This area also displays any error messages.

Status Bar

The status bar allows you to view the status of the connection.

Searching for Computers

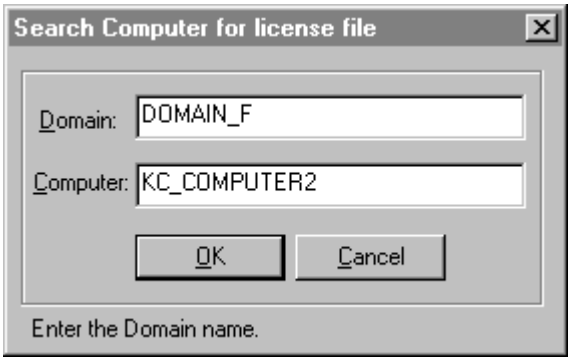
In order to browse, manage, or install license files, you must first establish connections to the computers on the network that use license files.

Searching by Name

If you know that a license file exists on a particular computer, you can search by name for that computer to see if it is available.

➢ **To connect to a computer by name:**

1. From the **Search** menu, click **Computer**. Or, click the  toolbar button.
2. The **Search Computer for License File** dialog box appears.



3. In the **Domain** box, enter the name of the domain in which the computer resides.
4. In the **Computer** box, enter the name of the computer on which you want to search for a license file.
5. Click **OK**.

   The computer will now be listed in the browser:

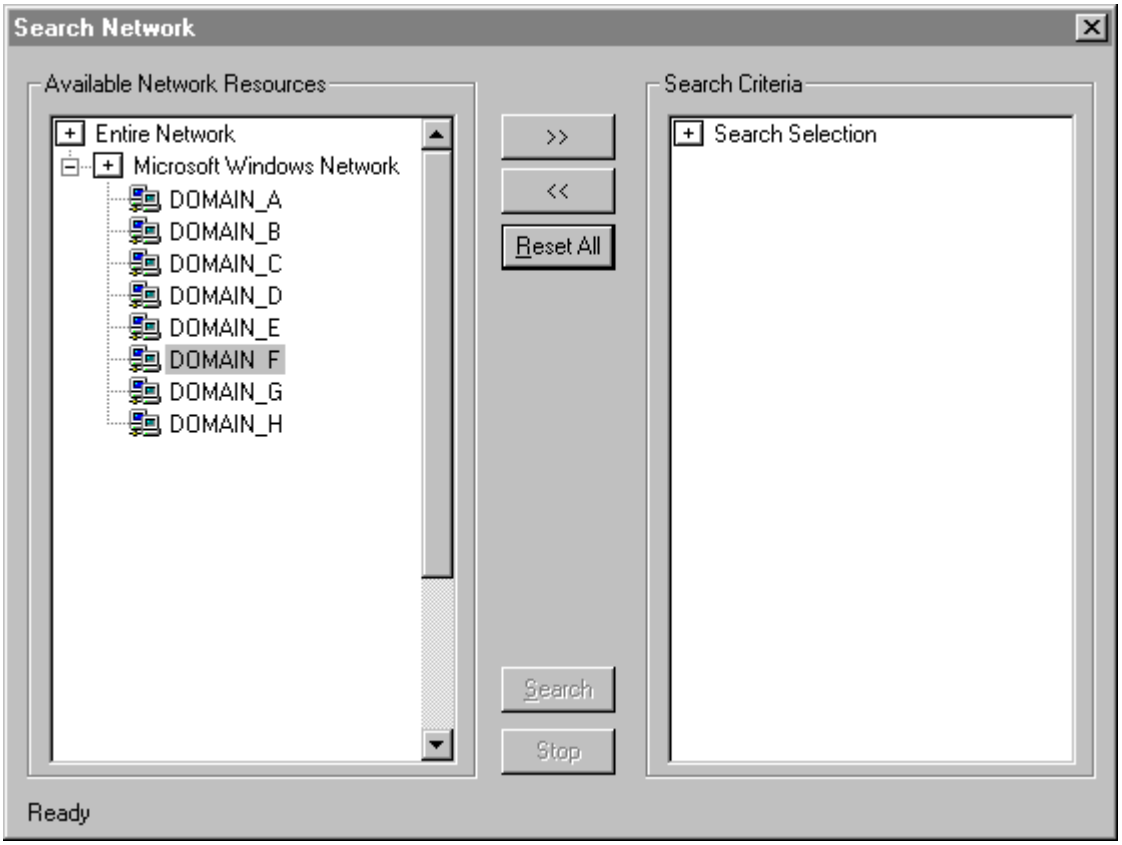
Searching the Entire Network

If you don't know which computers have license files, you can search the entire network and build a list that will be displayed in the browser.

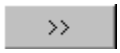
➢ **To search the network for computers with license files:**

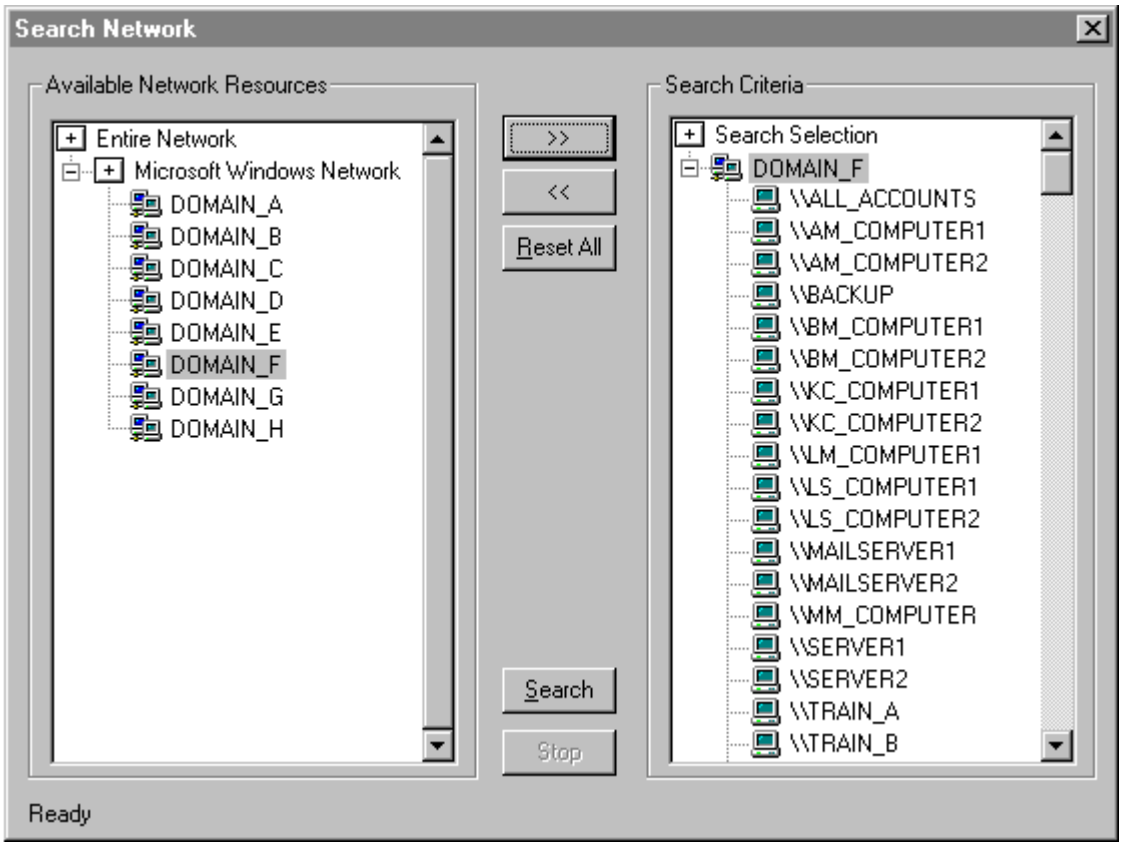
1. From the **Search** menu, click **Network**. Or, click the  toolbar button.

   The **Search Network** dialog box appears.



2. In the **Available Network Resources** window, highlight the name of the domain for which you want to search for computers having license files.

3. Click the  button to display all of the computers on that domain in the **Search Criteria** window. The computers in the **Search Criteria** list are computers that will be searched for license files. For example:



4. To exclude a computer from the search, select the computer in the **Search Criteria** window and click the  button.

5. To clear the **Search Criteria** window, click **Reset All**.

6. To start searching for computer that have license files, click **Search**.

   For a remote computer, the License Utility determines if it has a valid license file installed by examining the Wonderware$ share. For the local computer, the License Utility determines if it has a valid license file by reading the license path in the Registry.

   A message will be displayed along the bottom of the dialog box that indicates the status of the search (for example: 2 out of 147 searched).

7. To stop the search at any time, click **Stop**.

When the search is complete, all computers that have license files installed will be listed in the Results window of the License Utility.

To clear the browser of any searched computers, from the **File** menu, click **Clear Tree**.

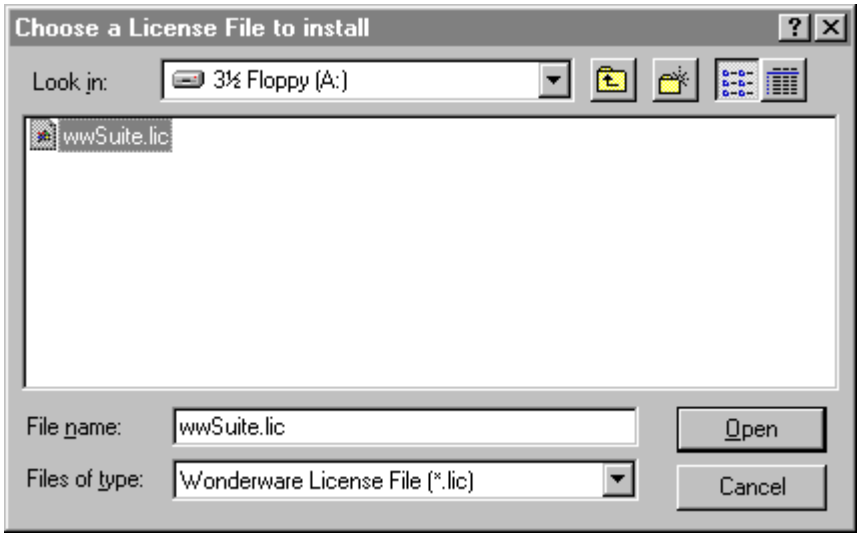
Installing a License

License files are shipped on floppy diskettes. By default, the License Utility will always prompt to install the license from the computer's floppy drive. If a license file does not already exist on the destination computer, one will be created that will be identical to the license file on the floppy. If a license file already exists, the new license file's component and feature line information will be appended to the existing license file. The license file on the floppy will be not deleted at the end of the install.

➢ **To install a license file:**

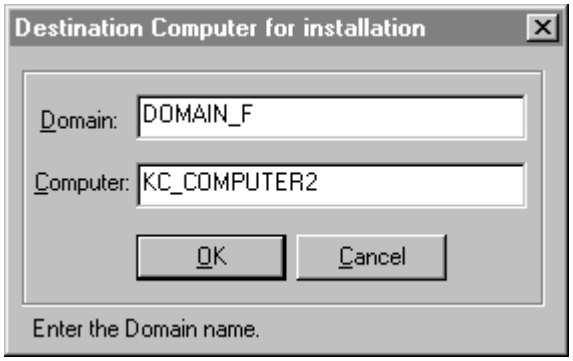
1. From the **File** menu, click **Install License File**. Or, click the  toolbar button.

   The **Choose a License File to Install** dialog box appears.



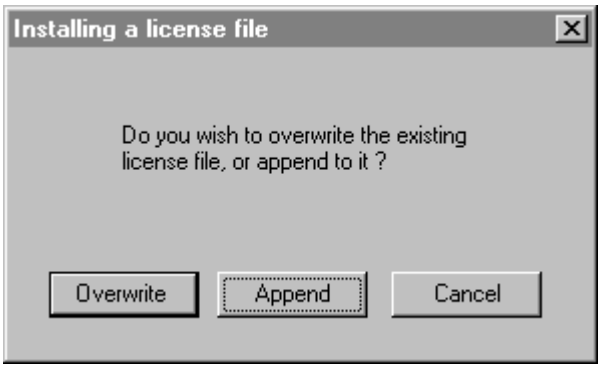
2. Select the license file (.LIC) to install and then click **Open**.

   The **Destination Computer for Installation** dialog box appears.



3. In the **Domain** box, enter the name of the domain in which the computer resides.
4. In the **Computer** box, enter the name of the computer on which you want to install the license file.
5. Click **OK**.

   If an existing license file exists, the **Installing a License File** dialog box appears.



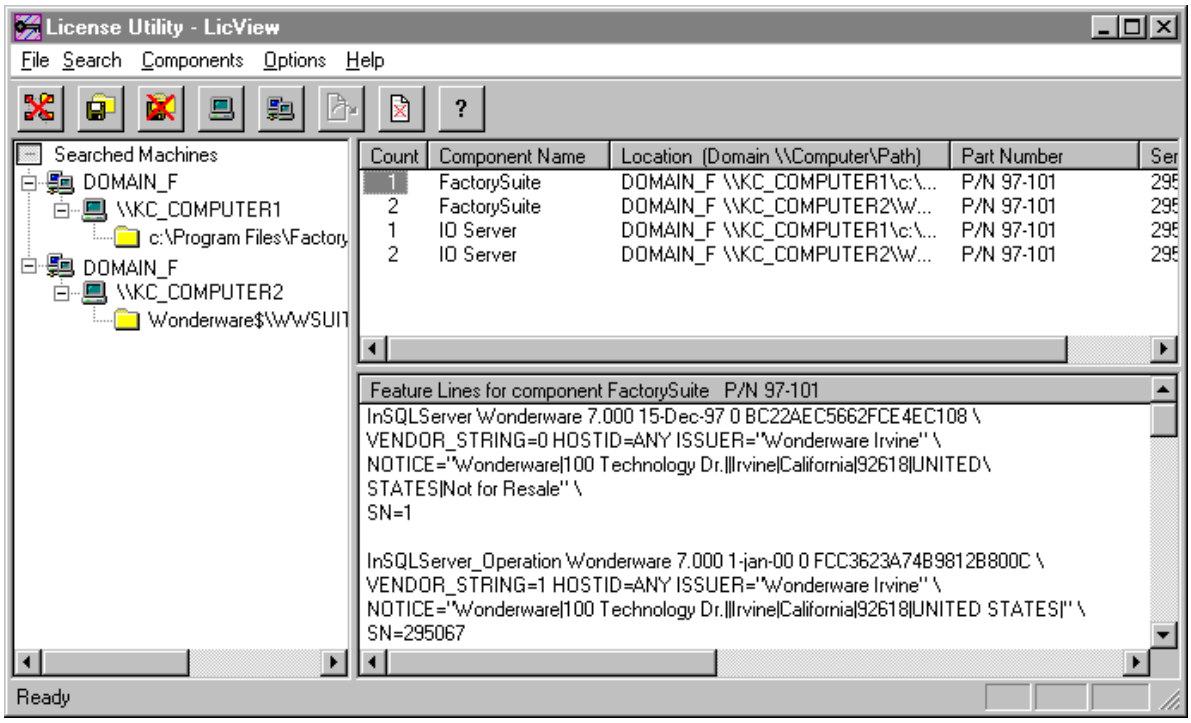
6. To overwrite the license file, click **Overwrite**. To append the new license file information to the existing license, click **Append**.
7. The results of the installation will be displayed in the Results window.

Browsing License Information

You can browse licensing information for any computer that is displayed in the License Utility browser.

➢ **To browse license information:**

1. In the browser, click on the share that contains the license file (the folder will be displayed in yellow).



2. All of the FactorySuite components licensed for use will appear in the Component window.

   For information on the columns in the Component window, see "Component Window" earlier in this chapter.

3. Select a component.
4. The feature lines for that component will appear in the results window. To view detailed feature lines, from the **Options** menu, click **Detailed Feature Lines**.

Moving or Deleting a License File

You can move an entire license file from one network computer to another. The License Utility only supports the move operation; **you cannot copy a license file or any component of a license file from one computer to another.**

- **To move a license file:**

1. In the License Utility browser, select the license file.
2. Drag-and-drop it into the destination computer.

   You will be prompted to verify the move.
3. To move the license file, click **Yes**. Otherwise, click **No**.
4. The results of the move will be displayed in the Results window.

- **To delete a license file:**

1. In the License Utility browser, select the license file.
2. From the **File** menu, click **Delete License File**.

Moving or Deleting a Component

You can move a single component in a license file from one network computer to another. The License Utility only supports the move operation; **you cannot copy a license file or any component of a license file from one share to another.**

- **To move a component:**

1. In the component window, select the component.
2. Drag-and-drop it into the destination computer. Or, click the  button.

   You will be prompted to verify the move.
3. To move the license file, click **Yes**. Otherwise, click **No**.
4. The results of the move will be displayed in the Results window.

- **To delete a component:**

1. In the License Utility browser, select the component. Or, click the  button.
2. From the **Components** menu, click **Delete**.

Upgrading to FactorySuite 2000 Licensing

Wonderware maintains an audit trail of all license file upgrades, and creates your FactorySuite 2000 license file (WWSUITE.LIC) accordingly.

Upgrading from a Hardware Key

Licensing was enforced by the use of a hardware key, or dongle, for all versions of Wonderware products previous to FactorySuite 1000 and as an optional licensing strategy for FactorySuite 1000. If you have upgraded from a Wonderware product that used a hardware key, the single license file that you will receive with FactorySuite 2000 will be "locked," or permanently associated with, your existing hardware key serial number.

Upgrading from FactorySuite 1000

For FactorySuite 1000, each product's licensing information was located in a separate product .LIC file. For example, INTOUCH.LIC, INTRACKD.LIC, IB_SERV.LIC, and so on. When a FactorySuite 1000 license file is upgraded to support FactorySuite 2000, a new single FactorySuite 2000 license file (WWSUITE.LIC) is created.

The separate FactorySuite 1000 license files are translated to feature lines within the WWSUITE.LIC license file. This includes all customer information, product data and functionality, customer types, hardware key serial numbers, license file expiration dates for consignment systems, and so on.

The serial number for each FactorySuite 1000 license file is consolidated into a single FactorySuite 2000 serial number for the WWSUITE.LIC license file.

Comment lines for each FactorySuite 1000 license file are merged into a single comment line in the WWSUITE.LIC license file. FactorySuite 1000 comment lines include information for the part description, component functionality, part number, and serial number.

Note If you upgrade from an 32K tag InTouch system for FactorySuite 1000 (both development and runtime) the license file will be modified to support the full 60K tag system.

Upgrading Consignment Systems

All FactorySuite 2000 consignment license files have an expiration date of 2/1/1999. This essentially provides a 14 month period before the license time out.

CHAPTER 8

FactorySuite Component Integration

The Wonderware FactorySuite is the first integrated suite of automation software products for manufacturing. The FactorySuite comes in one single package and delivers one powerful development environment that enables operators, engineers, supervisors and management to create plant floor applications and run their factories more efficiently and productively.

This chapter describes how each of the FactorySuite components integrates with other components.

For a list of common components that are used with all FactorySuite products, see Chapter 6, "FactorySuite Common Components."

Contents

ActiveX

FactorySuite components support ActiveX technology. ActiveX technology allows standalone software components, called ActiveX controls, to run and provide functionality from within another software program, called the ActiveX container.

ActiveX Controls

ActiveX controls, originally known as OLE controls or OCXs, are standalone software components that perform specific functions in a standard way. ActiveX controls define standard interfaces for reusable components. ActiveX controls are not separate applications. Instead, they are servers that are placed into a control container.

You can create ActiveX controls by using Visual Basic, Microsoft VC++ or other 3rd party development tools. You can also buy ActiveX controls from third-parties for specific functionality. These controls are packaged in the OCX form.

There are three main components of ActiveX controls: *properties*, *methods* and *events*. Properties are very similar to variables that you can modify, for example, Calendar.day, Control.height, and so on. Methods are similar to script function calls that you can call from the container.

Note To install Wonderware ActiveX controls, you must have a valid license file.

InTrack

InTrack ActiveX controls are designed to be used in the development of a runtime client application for InTrack. These controls provide a convenient means for displaying grids and lists of objects from InTrack, including activity objects (WIP and inventory lots, machines, etc.) and structural objects (routes, materials, work instructions, and so on). The InTrack ActiveX controls are highly configurable and support control over appearance, filtering and sortation of list data, and other properties. These controls also fire events whenever the selection or context is changed, allowing scripts to be associated with operator selections. These controls are to be used in place of the Wizard objects provided with previous versions of InTrack, and offer significantly more functionality than their predecessors. In addition, these controls make it incredibly easy to develop custom dialog boxes in lieu of the rigid and predefined dialogs provided by InTrack.

📖 For more information, see your *InTrack Runtime Development Guide*.

IndustrialSQL Server

ActiveTrend and ActiveEvent are two IndustrialSQL ActiveX controls that can be run from an ActiveX container, such as InTouch. ActiveTrend allows you to trend configured tag values from the IndustrialSQL Server. Use ActiveTrend just as you would the IndustrialSQL Trend client application. ActiveEvent is an ActiveX control that allows you to trigger an event in the IndustrialSQL Server from an external detector. For example, an InTouch script can trigger an IndustrialSQL event if you use this control in an InTouch application window.

📖 For more information, see your *IndustrialSQL Server Client Tools Guide*.

InControl

InControl includes an ActiveX control, the PID Factory Object. The PID Factory Object allows you to handle combinations of proportional, integral, and derivative control for your loop applications. There are several configuration parameters that allow you to control the behavior of the PID during runtime.

Like other InControl programs, a Factory Object can run independently. You can also call it for execution from another program.

📖 For more information, see your *InControl User's Guide*.

InBatch

InBatch ActiveX controls can be incorporated into an InTouch window and used during runtime to control and monitor batches. The SPC control visually depicts an active batch. The Batch control allows the user to schedule, monitor, and control batch execution.

📖 For more information, see your *InBatch User's Guide*.

ActiveX Containers

To use ActiveX controls, they must be placed in an ActiveX container. InTouch, InTrack, and InControl are all ActiveX containers. Microsoft VisualBasic and internet browsers are also ActiveX containers.

InTouch

You can use one or more ActiveX controls in your InTouch application. InTouch allows you to easily select and paste an ActiveX control into any application window and to add them to your **Wizards/ActiveX Toolbar**. You can also import ActiveX Event scripts from one application to another.

InTouch allows you to access ActiveX control properties, methods and events. An ActiveX property can be associated with an InTouch tag of a corresponding or mappable data type. Scripting functions to get and set an ActiveX's properties exist for each ActiveX property type that is accessible in InTouch. An ActiveX event can be associated with an InTouch script. When an ActiveX event occurs, each event parameter will be mapped to script local variables before invocation.

InTrack, InBatch, and IndustrialSQL Server all have ActiveX controls that can be used in WindowViewer. Some ActiveX properties, methods, and events may not be accessible from InTouch due to data types not supported in InTouch.

InTrack

Since InTouch WindowMaker is used to create the runtime graphical user interface for an InTrack application, you can incorporate ActiveX controls in these applications.

Also, the ActiveX transaction engine includes a number of new functions, increased performance and provides enhanced integration capabilities. The transaction engine is an ActiveX server through which all InTrack runtime functions are performed.

As a general note, InTrack ActiveX transactions should NOT be performed in scripts or QuickFunctions configured to execute asynchronously.

📖 For more information, see your *InTrack Runtime Development Guide.*

InControl

InControl includes the Factory Object editor, which is an ActiveX container that enables you to add Factory Objects (ActiveX controls) to a project. You can organize installed Factory Objects under one or more categories using the Factory Object editor, as well as configure Factory Objects.

📖 For more information, see your *InControl User's Guide*.

I/O Servers

An I/O Server is an application that provides data to a client. This section describes those elements of I/O Servers that interface with other FactorySuite components.

📖 For more information on a particular Wonderware I/O Server, see the user's guide for that I/O Server.

I/O Server Toolkit and Generic Client Toolkit

The purpose of the I/O Server Toolkit is to provide a single interface to both the DDE/FastDDE and SuiteLink server APIs. The I/O Server Toolkit is delivered as a library (TOOLKIT.LIB).

The I/O Server Toolkit abstracts the server specific code (*protocol engine*) from the client connection engine. The protocol engine code, therefore, does not need to manage any information relating to the number of, or types of clients connected to the I/O Server. Further, it provides connectivity to multiple clients through either the DDE (CF_TEXT, XL_TABLE, FastDDE) or SuiteLink interface; it supports simultaneous connections to both interfaces as well.

In general, no knowledge of the underlying transport (DDE or SuiteLink) is required to be able to write clients or servers when the client and server toolkits are utilized. The I/O Server Toolkit and the Generic Client Toolkit work in tandem to provide complete abstraction from the raw SuiteLink interface.

InTouch, InBatch, and InControl all use the I/O Server Toolkit.

📖 For more information, see your *I/O Server Toolkit User's Guide*.

TESTPROT.EXE

TESTPROT.EXE is an I/O Server that produces changing data without the need for connection to a real-world device. It is used to test an I/O client's ability to communicate to a server and to handle the data provided by a server.

For a detailed functional description, as well as the manner in which TESTPROT.EXE is used by a client tester, see the TESTPROT.HLP file that can be accessed from the Help menu in the TESTPROT.EXE application.

SIMULATE.EXE

SIMULATE.EXE is an I/O Server that produces example data of a simple chocolate milk mixer. It is used to test an I/O client's ability to communicate to a server and to handle the data provided by a server. SIMULATE.EXE is for testing purposes only; it is not a true I/O Server for use in production.

InTouch

Wonderware InTouch is the flagship family of powerful, flexible operator interface development tools for creating custom systems for discrete, process, DCS, SCADA and other types of manufacturing environments. InTouch is composed of WindowMaker, the development environment for creating a manufacturing application, and WindowViewer, the runtime environment for the application. InTouch also includes add-on products such as Recipe, SQL Access for InTouch, and SPC (standard).

This section describes those elements of the InTouch component that interface with other FactorySuite components.

📖 For more information on using these InTouch features to integrate the FactorySuite, see your *InTouch User's Guide*.

Network Communications

SuiteLink integration allows InTouch to communicate with an I/O Server using either the DDE (including FastDDE and NetDDE) or SuiteLink protocol. WindowViewer will use the communication protocols as follows:

- If DDE is selected as the protocol for an access name, then WindowViewer will communicate with the specified I/O Server using the DDE protocol.
- If WindowViewer is running on Windows NT and SuiteLink is selected as the protocol for an access name, then WindowViewer will communicate with the specified I/O Server using the SuiteLink protocol.
- If WindowViewer is running on Windows 95 and SuiteLink is selected as the protocol for an access name, then WindowViewer will communicate with the specified I/O Server using the DDE protocol.

The **SetDdeAppTopic()** function will work the same whether the access name is using the DDE or SuiteLink protocol. The **SetDdeItem()** function will work the same whether the access name is using the DDE or SuiteLink protocol. (Note that this function is another means of setting the "Reference" field for an I/O tag.)

WindowViewer can function as both a DDE and SuiteLink server. When functioning as an SuiteLink server, WindowViewer will handle quality and time as follows.

- For I/O tags, WindowViewer will propagate the quality and time provided by the I/O Server to the client.
- For memory tags, WindowViewer will provide the client with a quality of "good" and the current time.

Clients for WindowViewer acting as a DDE or SuiteLink server are I/O Servers, InBatch, IndustrialSQL Server, InControl, Scout.

Tag Browser

The Tag Browser is the primary tool for viewing and selecting local and remote tagnames and tagname **.fields** from other FactorySuite applications, or any other tag source that supports the InTouch Tagname Dictionary interface. It allows you to select existing tagnames, add new tagnames and view basic Tagname Dictionary information. You also use the Tag Browser to access the dialog boxes that allow you to perform tagname editing, replication, and to select tagnames (remote references) in remote tag sources.

The Tag Browser is built into WindowMaker, and is made available to other components via COM. The Tag Browser is currently used by InControl and InBatch.

Application Explorer

WindowMaker's Application Explorer is a hierarchical graphical view of your InTouch application. It shows you what items you have configured in your application and provides you easy access to those items. It also provides you with quick access to many of WindowMaker's most commonly used commands and functions.

On the Windows NT operating system, you can configure the Application Explorer to launch any other FactorySuite program or Windows program. This powerful feature allows you to quickly switch between your HMI configuration, I/O Server configuration, and control configuration.

The user can actually select a specific file such as a Word .DOC, or Excel .XLS file and the Application Explorer will launch the program displaying that file.

ActiveX

InTouch can be used as an ActiveX (OCX) container. WindowMaker supports ActiveX controls which, in their simplest form, are mini-applications that talk to or run within your application. WindowMaker supports all ActiveX controls that are included in Wonderware FactorySuite components. For example, all InTrack ActiveX controls. WindowMaker also supports third-party ActiveX controls such as those installed with Office97.

For more information, see "ActiveX" earlier in this chapter.

Tag Dictionary Interface

The Tag Dictionary Interface is used provide client applications the means to include their tag dictionaries in the InTouch Tag Browser. The toolkit is comprised of two parts: the client package and the tag dictionary manager package.

The client package represents the client application, such as InTouch, InBatch, InControl, and so on. The client package uses the services of the tag dictionary manager package to select a particular tag dictionary and bind it to a tag source. The tag dictionary manager package also provides the services to initialize and invoke the Tag Browser. The initialization process is as follows:

1. The client invokes the default tag dictionary, binding it to the applications default tag source.
2. The client invokes the Tag Browser (via the tag dictionary manager package), passing it default tag dictionary, a bound tag source, and list of access names.
3. The user can pick tags and select other tag dictionary and associated tag sources via Tag Browser interface.

IDEA Toolkit

The InTouch Database External Access (IDEA) Toolkit provides developers with a means of directly accessing data in the InTouch tagname database. IDEA supports developers who wish to produce separate Windows programs that access and/or change InTouch data as well as developers who prefer to remain in the realm of DOS programs. IDEA supports programs written in C as well as Microsoft QuickBASIC, Microsoft FORTRAN and Borland Turbo Pascal. The IDEA Toolkit has been upgraded to support SuperTags.

The following FactorySuite components use the IDEA Toolkit: InTrack, InBatch, and IndustrialSQL Server.

For more information on the IDEA Toolkit, see your *InTouch Database External Access Toolkit User Manual*.

Script API

The InTouch scripting extensions provides external applications with a means of manipulating InTouch data via scripts. InTouch script extensions are used by InTrack, InBatch, IndustrialSQL Server, and InControl.

History Providers

You can store and retrieve data from an IndustrialSQL Server database from InTouch. To do this, you must enable the historical logging option in the InTouch application and then choose IndustrialSQL Server as your history provider.

📖 For more information, see your *InTouch User's Guide*.

Wizard API

InTouch's Wizard API is an interface for creating wizards for use within an InTouch application. A wizard is a pre-configured graphical object that is used by the runtime operator to perform one or more simple tasks. Using wizards cuts down on the time required to make an InTouch application since all of the graphics, animation, and scripting needed to perform the task are usually already configured. All you may need to supply are a few task parameters (for example, the minimum and maximum ranges for a slider wizard).

Currently, the InTrack, InBatch, and InControl components each have a set of wizards that allow the runtime operator to perform tasks related to the component from InTouch WindowViewer. For example, a runtime operator might double-click on an InTrack "Consume" button wizard to consume an input material at a specific operation.

Custom wizards can be created using the Extensibility Toolkit for InTouch.

SPC Data

Statistical process control (SPC) is a method for monitoring and controlling a process by gathering data about the characteristics of the output, analyzing the data, and drawing conclusions based on that data. There are two versions of SPC for InTouch, the standard version of SPC and SPC Pro. The standard version of SPC is shipped with InTouch 7.0 and is a subset of SPC Pro. SPC can be used to store and retrieve data from a SQL Server or MS Access database. Since it embeds a Microsoft SQL Server, IndustrialSQL Server can be used to store and receive SPC data.

SPC Pro™ extends the functionality of FactorySuite's traditional SPC by providing new on-line statistical analysis tools to achieve better product and process quality, reduce costs, and increase yields. SPC Pro's high-configurable control and defect charts (EWMA, CuSum, u-chart, n-chart) monitor and track variation and defects over time. Designed to work as an on-line quality improvement tool for short, long, and continuous runs, SPC Pro features individual alarms to help users to quickly identify which statistical rules were violated. Users can track corrective actions, delete and modify samples, set limits and add special causes on the fly. For SPC Pro functionality, a separate license is required.

TAGNAME.NDX File

The TAGNAME.NDX file contains the InTouch application tag index. Access to InTouch data from Scout is enabled through the addition of an InTouch tag called WEBDIR, which contains the name of a "Tag List" file. Scout will use this file to determine which InTouch tags to expose on the web. If no special Tag List file is named, then Scout will use this TAGNAME.NDX index file. To generate a drill-down list of tags for a given InTouch application, Scout accesses the WEBDIR tag (through NetDDE), gets the name of the Tag List file and then returns the contents for display.

TAGNAME.X File

The TAGNAME.X file contains the tagname database for InTouch. By using the tag importing functionality from within IndustrialSQL Configure, you can easily import the tagname database definitions (contained in the TAGNAME.X file) from multiple InTouch nodes into the IndustrialSQL Server *Runtime* database. You can import one application per node. Importing tag definitions eliminates the need to manually define I/O Server and tag information for both the InTouch and the IndustrialSQL Server system.

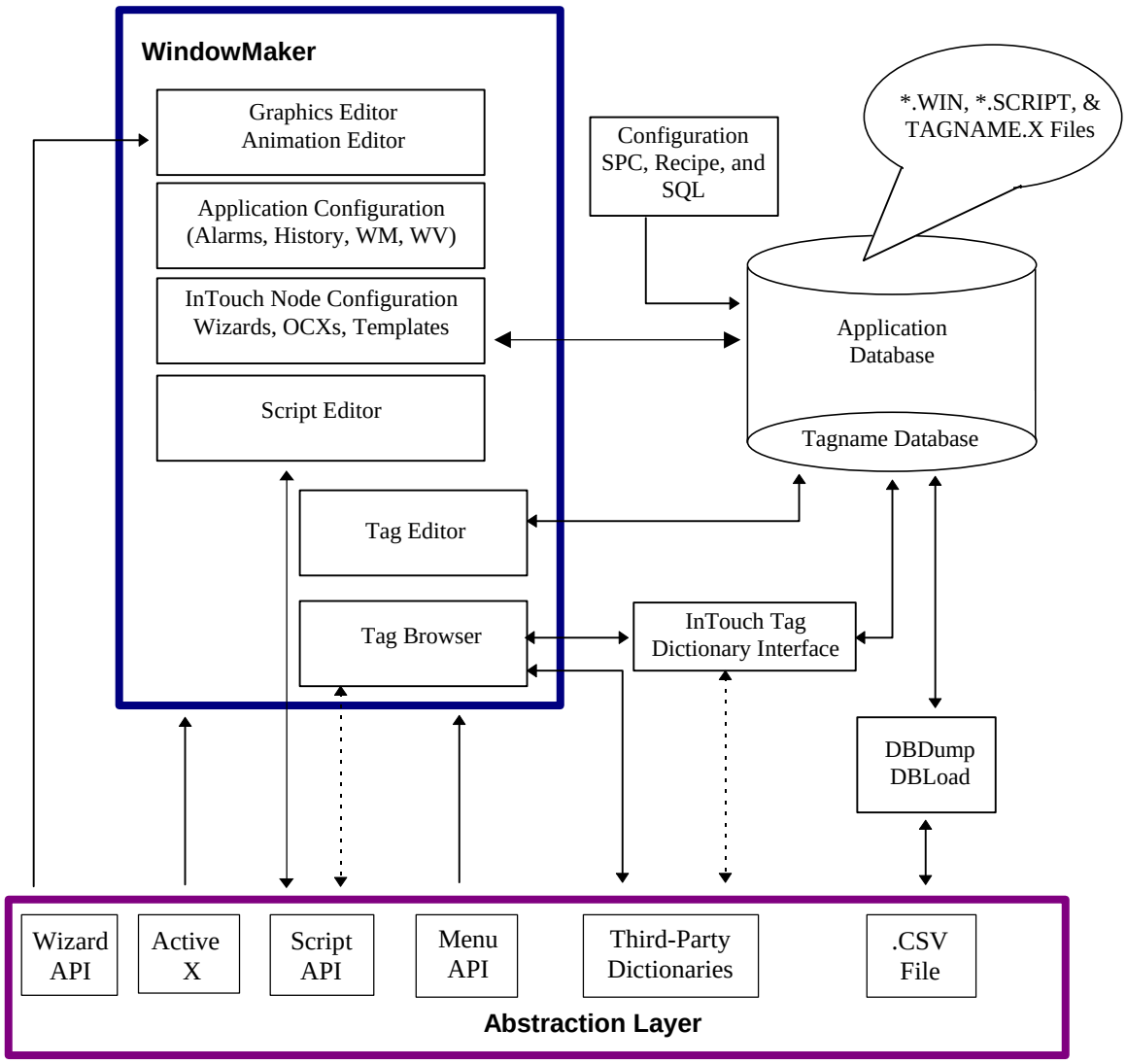
Once the tagname database is imported, data defined for an InTouch application will be stored in the *Runtime* database and can be manipulated using any SQL method for retrieving data supported by the IndustrialSQL Server. Functions specific to IndustrialSQL Server, such as setting the resolution for a query, can be applied to the data, and the data can be retrieved from any Wonderware client application.

InTouch Utilities

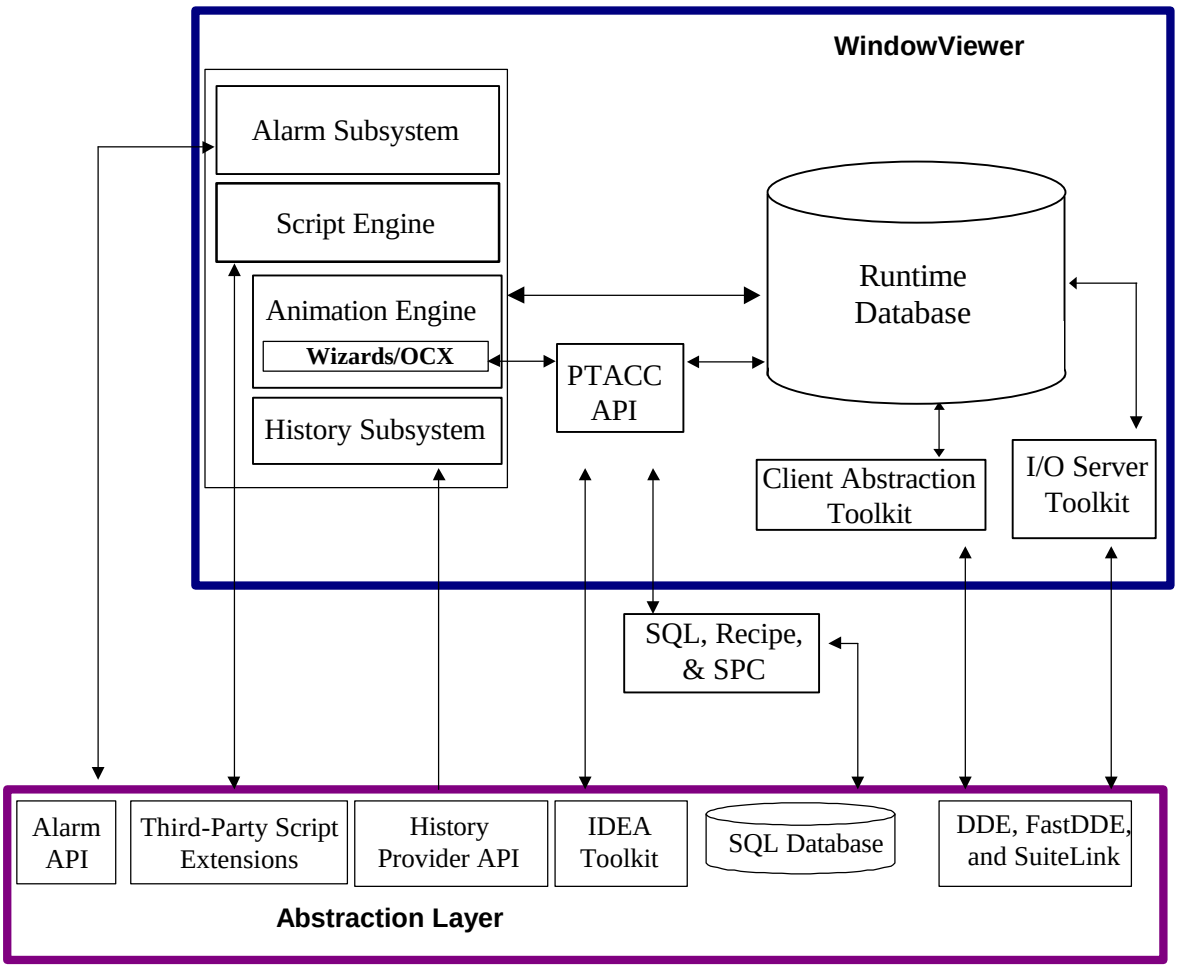
InTouch has four utilities that allow data to either be imported into the InTouch tagname dictionary or history files or exported from InTouch to other applications. Imported or exported data must be in the .CSV (comma-separated variable) file format. These utilities are described in the following table.

Utility	Used To
DBDump	Download an exact copy of a current InTouch application's tagname dictionary into a .CSV file. This file can then be modified using a spreadsheet or text editor program.
DBLoad	Upload database information in a .CSV file into an existing InTouch application's tagname dictionary. The database can be created using a different software application (for example, a Symbol Manager file from InControl) or can be a modified DBDump file.
HistData	Used with InTouch to retrieve requested historical data from the InTouch-encrypted historical log files (.LGH). HistData can also convert this historical information into a .CSV file for use with other software applications.
HistMerge	Merges a .CSV file into an existing InTouch application's historical log file (.LGH).

WindowMaker Interface Diagram



WindowViewer Interface Diagram



InControl

InControl is a real-time open architecture control system that allows you to design, create, test, and run application programs for controlling plant process. InControl is made up of the InControl Development Environment (ICDEV) and the Run Time Engine (RTE). Outputs from the Editors and Symbol Manager in development are compiled to make executable code for use by the RTE.

This section describes those elements of the InControl component that interface with other FactorySuite components.

📖 For more information on using these InControl features to integrate the FactorySuite, see your *InControl User's Guide*.

PLC and I/O Server Functionality

InControl is both a PLC (able to be programmed using a number of IEC languages like RLL and able to directly drive factory data) and an I/O Server (able to connect with InTouch and other clients interested in obtaining factory data). Because InControl is a "soft" PLC, it has many advantages over the traditional proprietary PLC, including ease of connectivity and versatility.

Using I/O Drivers, InControl connects to third party scanner cards that are directly connected to I/O racks and modules. I/O Drivers are in-process modules with two parts: a user interface in the InControl Development Environment and the execution code (Instruction Processor). The Instruction Processor is primarily responsible for getting external data to a running InControl program. Most I/O Drivers have an interface to a third-party scanner card.

InControl has a special interface (as part of the RTE) which allows InControl to participate in DDE, Fast DDE, and SuiteLink communications as a data server to client applications such as InBatch or IndustrialSQL Server. Using the included SuiteLink client driver, InControl can also act as client in these communications.

📖 For more information on setting up InControl to function as an I/O Client, see your *Wonderware InControl SuiteLink User's Guide*.

Tag Dictionary Interface

The Symbol Manager has a tag dictionary interface for the InTouch Tag Browser and is also accessible by one of the InControl Wizards. InControl's tag dictionary interface allows the InTouch Tag Browser to display InControl symbols.

Symbols are included in the compile, and the Run Time Manager makes appropriate connections for run time support. Symbol Manager has the capability to export a file in the .CSV (comma-separated variable) format. This .CSV file can then be loaded into InTouch using the DBLoad utility. You can also import an InTouch tagname dictionary (in the .CSV format) into InControl and read InControl symbols from InTouch tagnames.

Wizards

An InControl wizard is a pre-defined set of graphical objects and animation links that provide InTouch applications the ability to perform a task related to process control. The InControl wizards are installed in the InTouch directory during InControl installation. InControl wizards allow fast tag creation in InTouch and dynamic switching between WindowViewer and the control code in InControl. InControl wizards allow you to:

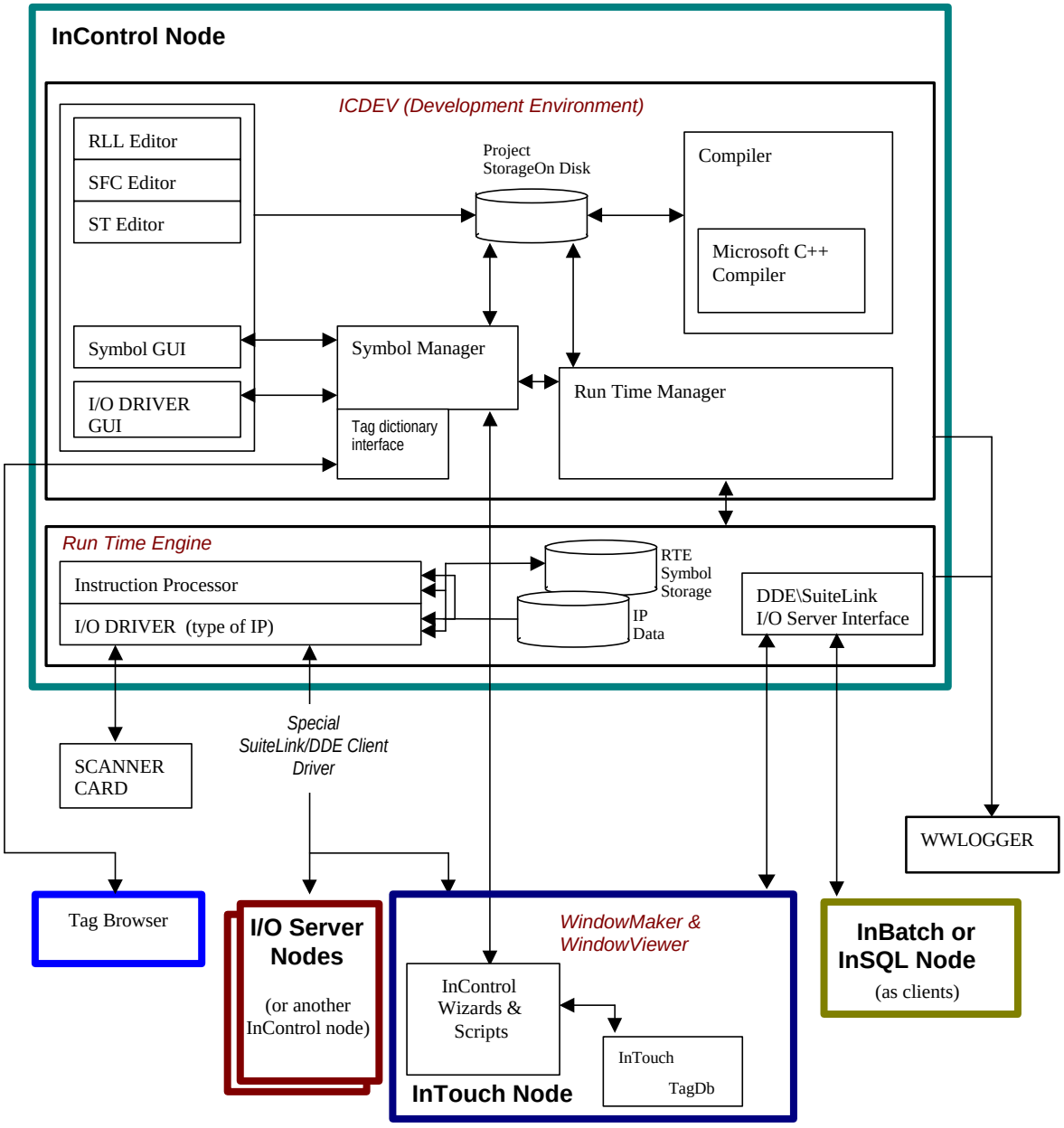
- Switch between specific points in InControl and WindowMaker or WindowViewer at runtime.
- Change the mode of InControl in a running WindowViewer application.
- Import symbols from InControl to InTouch

ActiveX

InControl's Factory Object editor allows you to incorporate ActiveX controls, including the InControl PID Factory Object, into a project.

For more information, see "ActiveX" earlier in this chapter.

InControl Interface Diagram



IndustrialSQL Server

IndustrialSQL Server is Wonderware's open relational database for plant and process data. This section describes those elements of the IndustrialSQL Server component that interface with other FactorySuite components.

📖 For more information on using these IndustrialSQL Server features to integrate the FactorySuite, see your *InTouch User's Guide*.

SQL

SQL (Structured Query Language) is a standardized language for data access. It allows definition of data structures, querying, inserting , updating and deleting of data. Industrial SQL Server supports the "Transact-SQL" extensions to the language, which are Microsoft's implementation of an ANSI 92 compliant superset of SQL.

Any client application that can retrieve information using SQL can retrieve data from IndustrialSQL Server. FactorySuite components that use SQL are InTouch, InTrack, InBatch, and Scout.

Industrial-SQL

In addition to the extensions provided by Transact-SQL, IndustrialSQL Server further extends SQL to improve the ability to handle time series data. These extensions are called Industrial-SQL. The primary extensions include:

- The ability to query live (real time) data with a single SQL query. Data is returned to the client whenever it changes on a continual basis until the client terminates the query.
- The ability to control the apparent time resolution of historical data.
- The ability to retrieve data in cyclic or delta mode independently of the underlying storage method.

Industrial-SQL is supported by Scout, IndustrialSQL client applications, and InTouch (through the medium of a third-party history provider).

📖 For more information on using Industrial-SQL extensions to retrieve data from an IndustrialSQL Server, see your *IndustrialSQL Server Industrial-SQL Reference*.

Data Storage

IndustrialSQL Server can retrieve data from any client application that supports DDE or SuiteLink. Wonderware client applications that can send data to IndustrialSQL Server are I/O Servers, InControl, and InTouch WindowViewer.

Alarm Groups and SuperTags

Using IndustrialSQL Configure, you can import InTouch alarm and SuperTag grouping information and view these groupings in the IndustrialSQL Configure browser.

IndustrialSQL as an InTouch Historian

Data stored in the IndustrialSQL Server *Runtime* database can be retrieved and viewed from any InTouch application that is configured to use IndustrialSQL as a history provider. A history provider is any external historical database that can be accessed by InTouch.

📖 For more information configuring history providers in InTouch, see your *InTouch User's Guide*.

ActiveX

ActiveTrend and ActiveEvent are two IndustrialSQL ActiveX controls that can be run from an ActiveX container, such as InTouch. ActiveTrend allows you to run the IndustrialSQL Trend program (or a functional subset) from within the ActiveX container. ActiveEvent allows you to notify the IndustrialSQL Event sub-system when an event has occurred in another application.

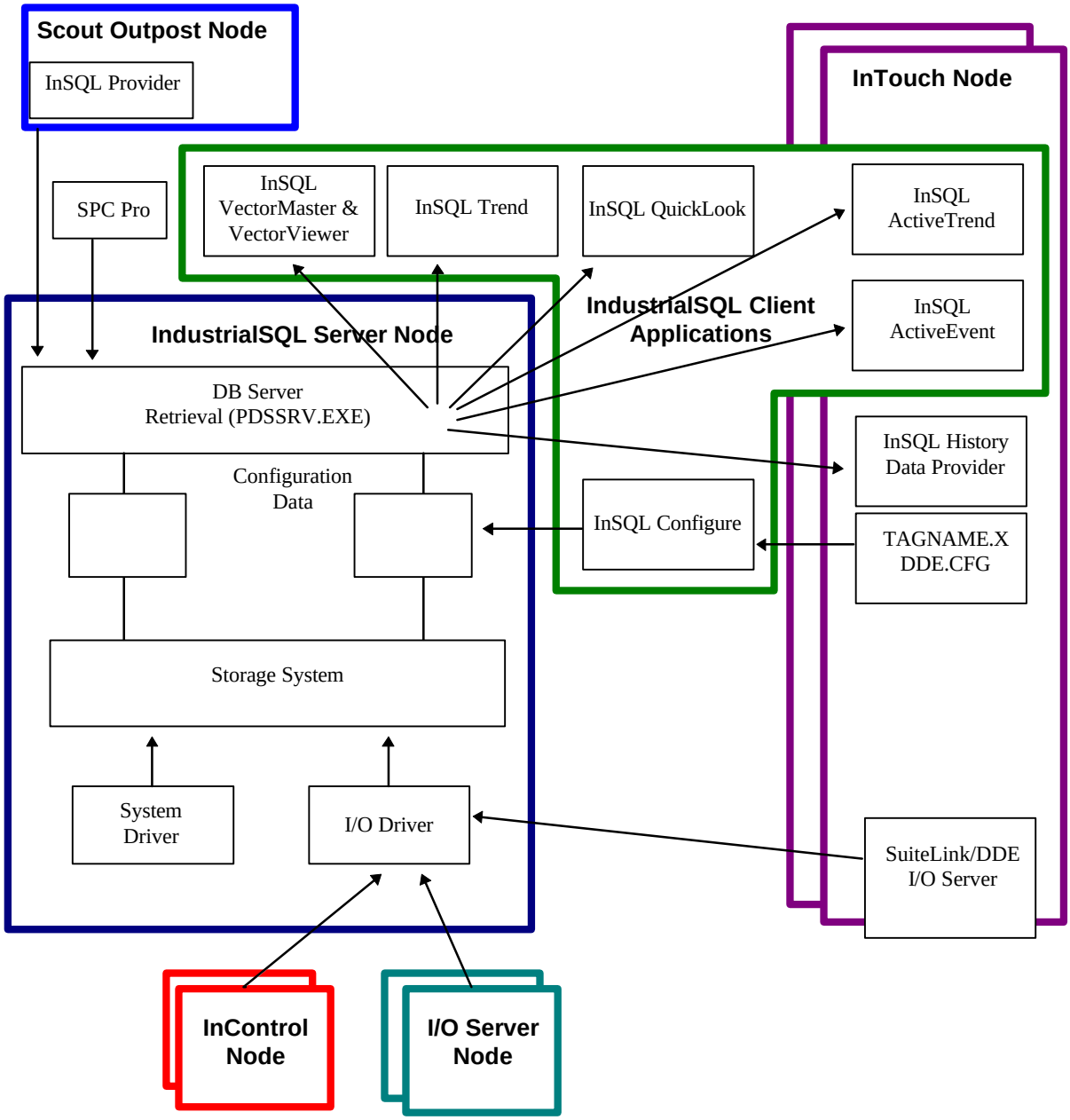
For more information, see "ActiveX" earlier in this chapter.

SQL Access for InTouch

SQL Access for InTouch allows you to access, modify, create, and delete tables in a relational database. Using SQL Access for InTouch, you can:

- Transfer data from a SQL database to an InTouch application.
- Transfer run-time data, alarm status, or historical data from InTouch to the SQL database.

IndustrialSQL Server Interface Diagram



Scout

Scout is an Internet visualization tool for viewing real-time data over the Internet. This section describes those elements of the Scout component that interface with other FactorySuite components.

📖 For more information using Scout, see your Scout documentation.

ScoutISS Data Agent

A Scout "data agent" (a server-side data provider) named *ScoutISS* can access the IndustrialSQL Server tagname database to retrieve the list of tags. This "tag list" is displayed in Scout VT client in a manner consistent with the existing interface and data agents. Scout VT will be able to "browse" an IndustrialSQL Server database.

Since ScoutISS is constructed using the Scout Data Agent Toolkit, it is immediately compatible with all existing and planned Scout Outposts. This data agent is a Scout "plug-and-play" component requiring no special installation.

A Scout VT user can map "real-time" data coming from an IndustrialSQL Server data provider through the ScoutISS data agent. After a user selects a tag from the drill-down "browse" list for the IndustrialSQL Server database, the Scout VT maps the value for the selected tag to a standard Scout graphical object. Scout VT will then collect the data and update the graphics element's input method.

Note Scout does not support the retrieval of historical data in this release; only the most recent (current) data can be retrieved.

WEBDIR

Scout VT accesses InTouch data through NetDDE connections to the Scout Outpost. Any InTouch tag data can viewed through this data pipeline but, for security reasons, Scout requires that a user explicitly designate what (if any) data from an InTouch application is to be exposed on the web.

Access to InTouch data is enabled through the addition of an InTouch tag called WEBDIR, which contains the name of a "Tag List" file. Scout will use this file to determine which InTouch tags to expose on the web. In this v1.0 release you may restrict the list of tags seen by Scout by specifying a user created "Tag List" file. The format for a Scout Tag List file is very simple, just tag names separated by spaces, tabs or carriage returns. If no special Tag List file is named then Scout will use the InTouch application tag index file "TAGNAMES.NDX". To generate a drill-down list of tags for a given InTouch application, Scout accesses the WEBDIR tag (through NetDDE), gets the name of the Tag List file and then returns the contents for display.

InBatch

Wonderware InBatch is scaleable batch management software designed to model and automate batch-oriented production processes. This section describes those elements of the InBatch component that interface with other FactorySuite components.

📖 For more information on using these features to integrate the FactorySuite, see your *InBatch User's Guide*.

Phase Logic

The phase logic interface defines the status and control interface between InBatch and the control system (that is, the PLC and InControl). This interface consists of six valid states: READY, INTERLOCKED, RUN, HELD, DONE, and ABORTED. The interface also consists of five InBatch initiated phase controls: START, HOLD, RESTART, ABORT, and RESET.

Tag Interface Management (TIM)

The Tag Interface Management (TIM) System is a tag-based interface to the main internal InBatch systems from an InBatch server, InTouch client, or control system interface. The TIM interface will be used if any of the following is true:

- An InTouch client has been configured to use one or more of the InBatch wizards.
- An InTouch application is developed that requires a custom graphical and/or script interface to one or more of the batch management system, security system, history system, or operating system.
- The control system (that is, the PLC) can support and will be designed to interface to one or more of the batch management system, security system, history system, or operating system functions.

Tag Dictionary Server

The InBatch Tag Dictionary Server provides a means of providing InBatch tags (control and TIM) to the InTouch Tag Browser. The InBatch Tag Dictionary Server is an in-process server (developed using the Tag Dictionary Toolkit) that is loaded into the InTouch Tag Browser. The Tag Dictionary Server reads the available InBatch tags from the CfgModelDB and CfgLinkDB databases and provides the resulting list of tags to the InTouch Tag Browser via a standard COM interface.

Tag Linker

The InBatch Tag Linker is an editing utility that links tag information on the InBatch database to the Tag Dictionary Server. Using the Tag Linker, you can:

- Link InBatch tags with an I/O Server (or other DDE or SuiteLink applications).
- Link InBatch tags to InTouch tags.
- Create a comma separated variable (.CSV) file of user-selected tags for direct import into InTouch using the DBLoad utility.

Note With the new remote tag capability, the only required use of this interface is to import batch function tags. Other TIM tags are accessed directly from InBatch as remote tags.

Wizards

An InBatch wizard is a pre-defined set of graphical objects and animation links that provide InTouch applications the ability to perform a task related to batch control and monitoring. The InBatch wizards are installed in the InTouch directory during InBatch client installation.

The wizards are controlled at runtime via standard tag updates and add-on scripts created for InBatch to manage control requests being sent back to the InBatch server.

ActiveX

InBatch ActiveX controls can be incorporated into an InTouch window and used during runtime to control and monitor batches.

For more information, see "ActiveX" earlier in this chapter.

InTouch Script Functions for InBatch

The InTouch script add-on functions provide read and write (request and poke) capabilities with other DDE or SuiteLink applications, including InBatch. These functions are faster than the standard WWPoke and WWRequest functions and should be used for all pokes and requests to InBatch Tag Interface Management (TIM) tags. These functions are added to InTouch during the InBatch Runtime Client installation.

IBCli and IBServ

IBCli is the interface to Wonderware IO Servers and InControl. IBCli reads and writes tags to the control system using the I/O Client Abstraction layer. IBCli is also used to send pass data to and from InBatch wizards and InTouch script functions and the TIM Managers (TIMBatch and TIMSec).

IBServ (and IBFuncServ for TIMFunc tags) is used to serve TIM tags to both DDE/FastDDE and SuiteLink clients (that is, WindowViewer).

Although these interfaces support FastDDE/DDE and SuiteLink, SuiteLink is preferred for its reliability.

Historical Data Storage

A standard ODBC interface is used to store batch historical data in the IndustrialSQL Server (SQL Server database). BatchMngr, LogMngr, and WWEXTALM.DLL use this interface.

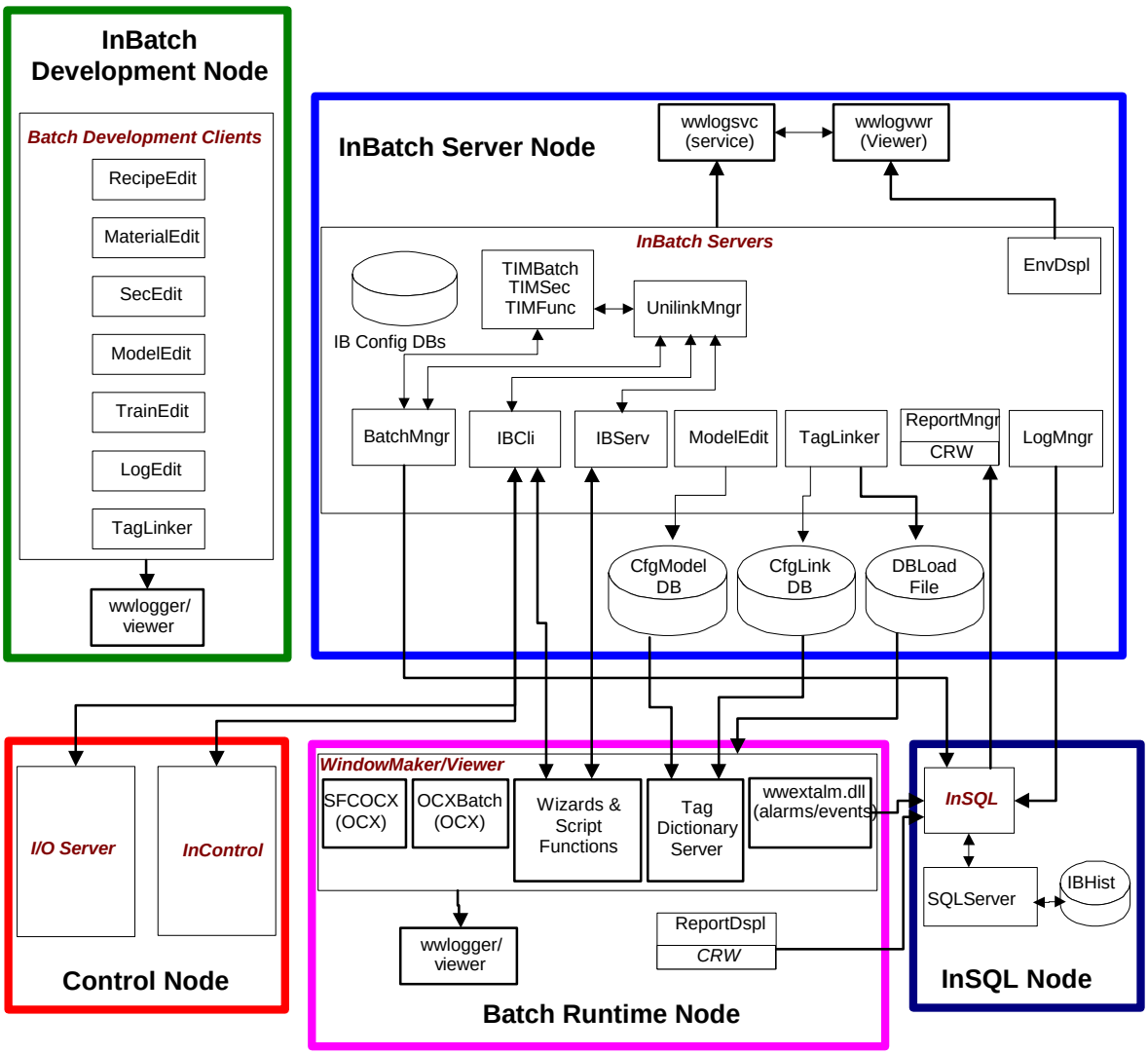
Historical Data Reporting

This is an ODBC interface to IndustrialSQL Server (SQL Server) for reporting on batch historical data. The interface is implemented using the Crystal Reports Writer reporting engine. The InBatch Report Manager and the Report Display operation both use this interface to generate batch historical reports.

Alarms/Event Storage

InTouch's WWEXTALM.DLL is used as an interface to capture alarms/events received by InTouch for storage with batch history data.

InBatch Interface Diagram



InTrack

Wonderware InTrack is a graphical application development tool for building client/server applications to monitor, manage and improve production operations. This section describes those elements of the InTrack component that interface with other FactorySuite components.

📖 For more information on using these features to integrate the FactorySuite, see your *InTrack User's Guide*.

InTrack Automation Server

ActiveX automation is implemented using the InTrack Automation Server and a corresponding type library. This server provides access to InTrack runtime functionality via automation to allow design/development of custom client applications (that is, access to the data and functionality provided by Amount, DateTime, Lot, Sublot, Query, Machine Objects, and so on). The InTrack Automation Server provides programmability of InTrack runtime objects from automation clients such as Visual Basic and InTouch.

The InTrack Automation Server is currently accessed from the following interfaces:

- From InTouch using the ActiveX automation support in its scripting language
- From any automation client, such as Visual Basic, through standard ActiveX automation syntax.

ActiveX

InTrack's ActiveX controls provide rapid InTrack client development using pre-packaged query-based controls (for example, ITSelector, ITQueryList, and so on). These controls can be used within InTouch or Visual Basic.

For more information, see "ActiveX" earlier in this chapter.

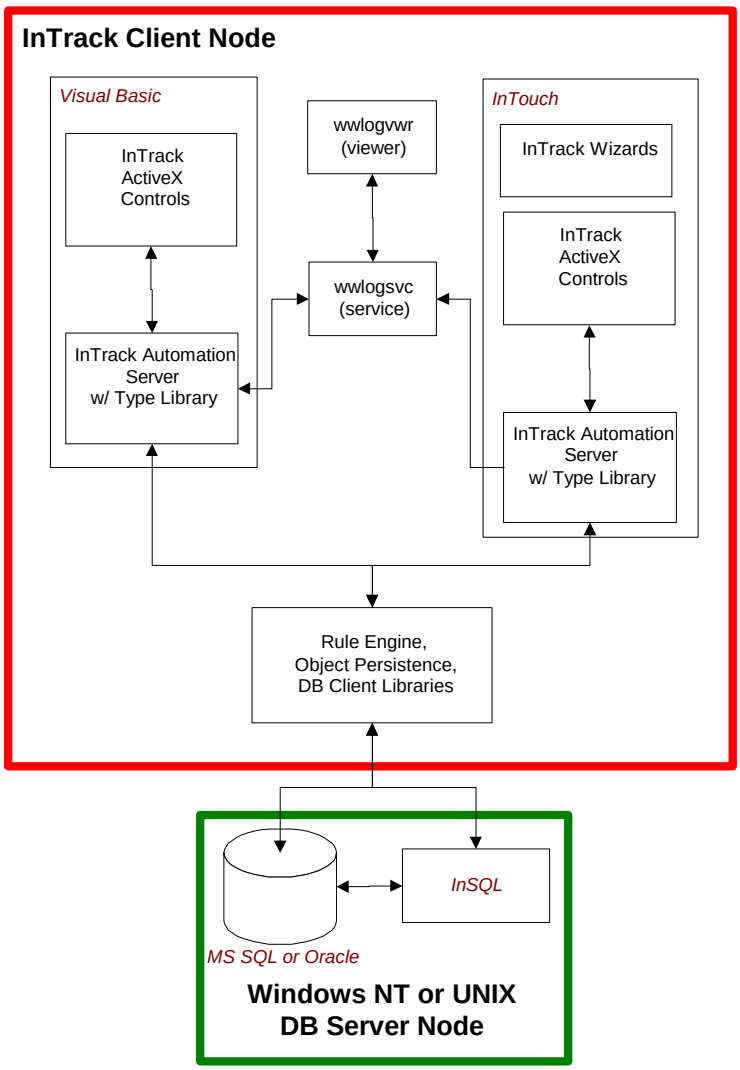
Wizards

An InTrack wizard is a pre-defined set of graphical objects and animation links that provide InTouch applications the ability to perform a task related to production operations. The InTrack wizards are installed in the InTouch directory during InTrack client installation. The InTrack wizards are provided for backward compatibility only and should not be used in new InTrack development projects, as they have been superseded by the ActiveX controls.

Support for IndustrialSQL Server

InTrack currently supports either Oracle or Microsoft SQL Server databases for storing the process model and runtime data. IndustrialSQL Server may be used in place of a standard MS SQL Server connection.

InTrack Interface Diagram



Tag Naming Conventions

This section describes the differences in tag naming conventions for FactorySuite components. When creating new tags, you should use a tagname that complies with all conventions.

IndustrialSQL Server Tagname Conventions

Tagnames that are stored in the IndustrialSQL Server have the following restrictions:

- Tagnames can contain from 1 to 33 characters.
- Any letter or symbol may be used, with the exception of spaces.

For best integration with Microsoft SQL Server, we strongly recommend that tagnames also adhere to the rules for Microsoft SQL Server identifiers, which are:

- Identifiers can contain from 1 to 30 characters, including letters, symbols, and numbers.
- The first character of the identifier must be a letter or a symbol.
- Characters following the first character can include letters, digits, or the symbols #, $, or _. (InTouch also allows "$" as a first character.)
- By default, no embedded spaces are allowed in identifiers; however, by using quotes around identifiers, spaces and other special identifiers can be defined.

If a tagname does not comply with the rules for Microsoft SQL Server identifiers, the IndustrialSQL Server will automatically create an acceptable alias that is derived from the tagname. A tag can be referred to by either the original tagname or the alias.

Note The IndustrialSQL Server *Runtime* database, however, is case-sensitive.

InTouch Tagname Conventions

Tagnames that are stored in the InTouch tagname database have the following restrictions:

- Tagnames can contain from 1 to 32 characters.
- First character must be A-Z, a-z, or a $.
- Remaining characters could be A-Z, a-z, 0-9, or the symbols !, @, -, ?, #, $, %, _, &

Note InTouch does not differentiate between upper- and lower-case letters in tagnames. In the InTouch tag naming convention, the letter "A" is equivalent to the letter "a".

InControl Tagname Conventions

InControl tagnames must be IEC-1131 compliant:

- Tagnames can contain from 1 to 255 characters.
- Only alpha-numeric characters are supported (A-Z, a-z, 0-9), along with an underscore (_).
- First character cannot be a number; however, it can be A-Z, a-z, or _.
- Characters that are not alpha-numeric or an underscore are illegal. For example, !, @, -, ?, #, $, %, &.

Rules for FactorySuite Compliant Tagnames

The following rules apply for tagname verification in InTouch:

- 30 characters long
- First character must be A-Z, a-z
- Characters following the first character can include letters, digits, or the symbol _.
- By default, no embedded spaces will be allowed in identifiers.
- Naming "A" will be equivalent to "a".

CHAPTER 9

Maintenance and Diagnostics

This chapter describes the utilities you can use to help maintain your FactorySuite system and diagnose problems.

Contents

Performing Backups

A long-term storage media that you can use for backing up data files is magnetic DAT tape. The following sections describe how to back up and retrieve selected files to and from DAT tape using the Windows NT Backup utility.

Performing a Data Backup

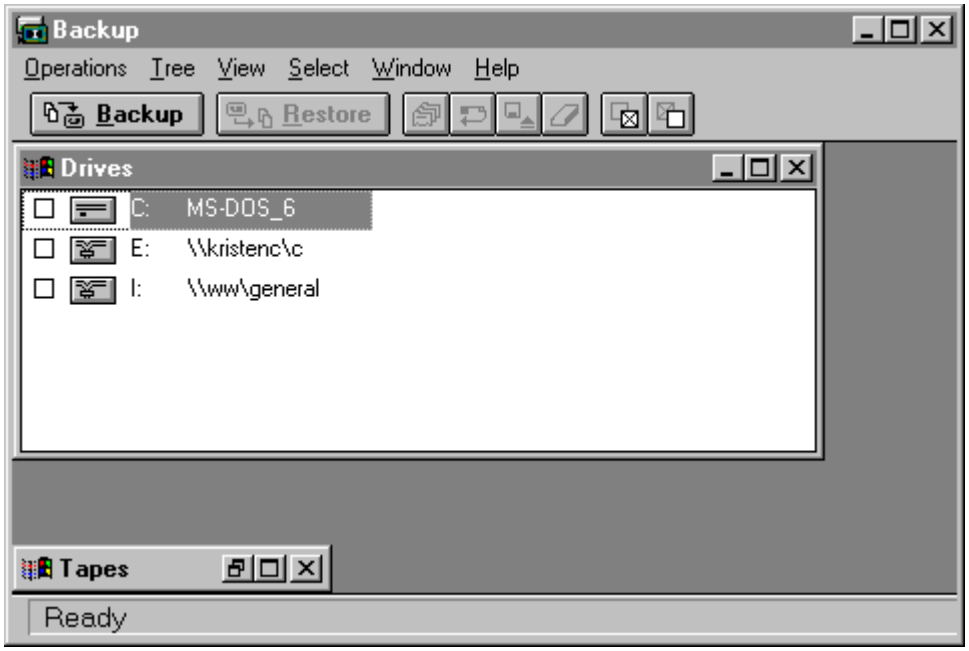
All data backup operations are performed using the Windows NT Backup utility (NTBACKUP.EXE). Before you perform a backup, be sure that a DAT tape drive is connected to the server machine, and that a DAT tape is inserted into the drive.

To make the retrieval of backed-up data easier, we recommended that you maintain a current record of DAT tapes and their contents.

Note The Windows NT Backup utility will not back up files that are currently in use.

➢ **To perform a data backup:**

1. In the Windows NT Administrative Tools group, start up the Windows NT Backup utility. Directory views of available disk drives and stored data sets on the DAT tape will appear:



2. In the **Drives** window, double-click the drive on which the files area currently stored.
3. Select all of the historical data files (directories) to back up to DAT tape.
4. From the **Select** menu, click **Check** to specify the selected files for backing up. A check mark appears in the check box beside each selected file.
5. From the **Operations** menu, click **Backup**.

   The **Backup Information** dialog box appears.

   The upper section provides information on the tape that you loaded.
6. If you are using a new DAT tape, enter a name for the backup (fewer than 32 characters) in the **Tape Name** box. Or, choose an existing DAT tape from the drop-down list.

7. To append the new backup set after the last backup set on the DAT tape, select the **Append** option in the **Operation** group. Or, click **Replace** to overwrite all the information on the tape.
8. Configure the optional backup settings, if appropriate.
9. Click **OK**.

The Windows NT Backup utility will execute the backup operation and inform you of the status of the operation once it is completed. For more information on using the Windows NT Backup utility, including troubleshooting unsuccessful backups, refer to the Microsoft documentation.

Retrieving Data from a Backup

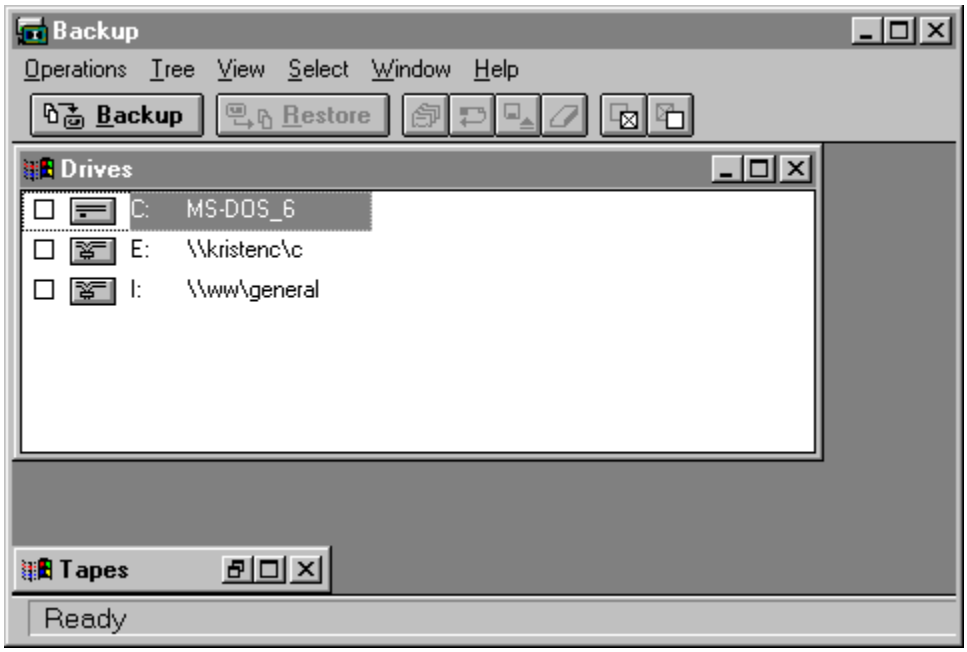
All data restoration operations are performed using the Windows NT Backup utility (NTBACKUP.EXE). Before you restore data from a backup, be sure that a DAT tape drive is connected to the server machine, and that a DAT tape is inserted into the drive.

Two steps are required for retrieving data from tape: loading the tape's catalog of backup sets and performing the data retrieval.

Loading the Tape Catalog

➢ **To load catalogs for tapes and backup sets:**

1. In the Windows NT Administrative Tools group, start up the Windows NT Backup utility. Directory views of available disk drives and stored data sets on the DAT tape will appear:



2. In the **Tapes** window, select the tape or backup set for which you want to load a catalog.
3. From the **Operation** menu, click **Catalog** to load the catalog. When the catalog has finished loading, a complete list of backup sets on the tape appears in the **Tapes** window.

Performing Data Retrieval

➢ **To retrieve data from a backup:**

1. Start up the Windows NT Backup utility and load the catalog for the tape or backup set that contains the historical data files you want to retrieve. The Backup utility's main window displays directory views of available disk drives and of stored data sets on the DAT tape.

   For instructions on starting the Backup utility and loading a tape catalog, see "Performing a Data Backup" earlier in this section.

2. In the **Tapes** window, select all of the historical data files (directories) to retrieve from the DAT tape.

3. From the **Select** menu, click **Check** to specify the selected files to retrieve. A check mark appears in the check box beside each selected file.

4. Specify the directory path to which you want to restore the data.

   We recommend keeping the default settings for the restore directory path. If you keep the default settings, the data will be restored to the path from which it was originally backed up and will minimize the configuration needed to make the restored data visible. Only advanced administrators should attempt to restore data to other locations.

5. From the **Operations** menu, click **Restore**.

6. If data is successfully restored to the default directory path, you must restart the computer before the data is visible on the network.

The Windows NT Backup utility will execute the retrieval operation and inform you of the status of the operation once it is completed.

For more information on using the Windows NT Backup utility, including troubleshooting an unsuccessful retrieval, refer to the Microsoft Windows NT Backup utility documentation.

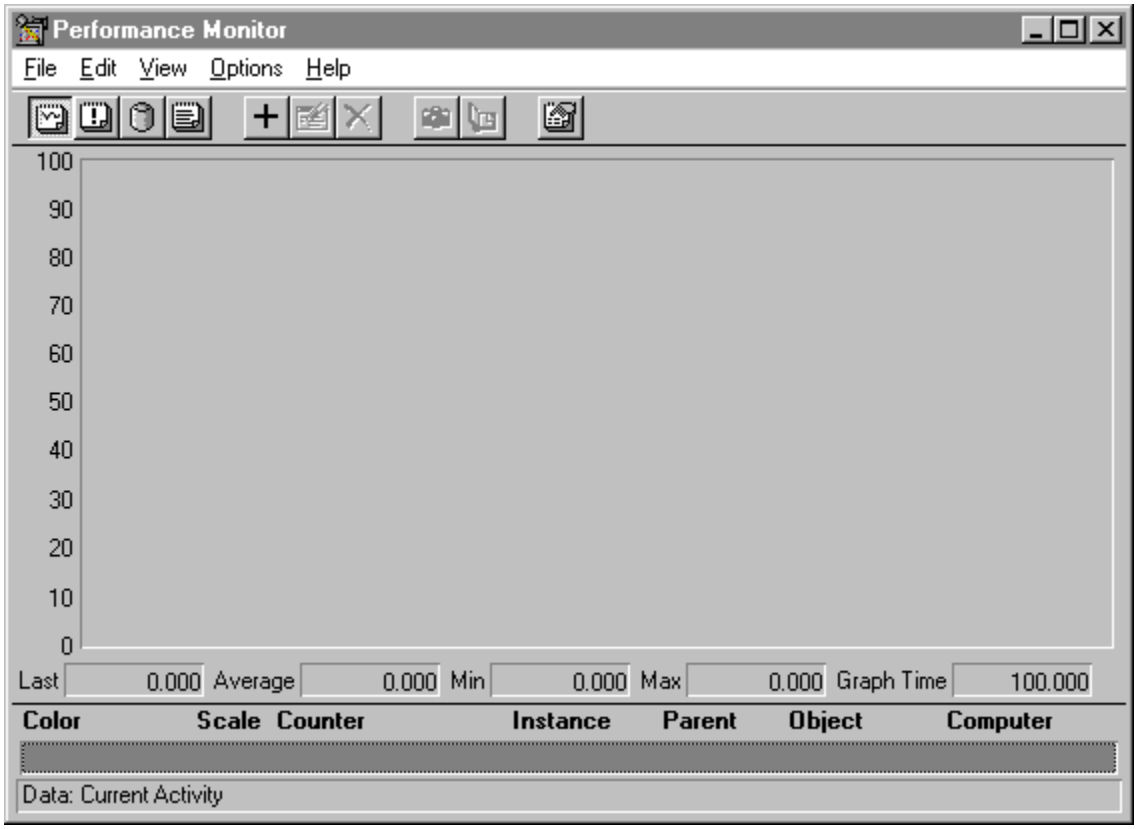
Using Performance Monitor

The Microsoft NT Performance Monitor (PERFMON.EXE) can be used to monitor system variables with respect to the operating system and the hardware. Performance Monitor is included with both Windows NT Workstation and Windows NT Server and can be used to monitor a remote computer that is also running the Windows NT operating system.

This section provides some tips on how to use Performance Monitor to effectively monitor your system and identifies some of the more useful objects and processes to monitor.

➢ **To start the Performance Monitor:**

1. From the **Start** menu on the Windows Taskbar, point to **Programs**, and then point to the **Administrative Tools** group.
2. Click **Performance Monitor**.
3. If Performance Monitor has not previously been configured, it will start up with an empty main window.



Counters

Performance Monitor allows you to view different types of counters that have been incorporated into the Windows NT operating system. Counters are associated with objects and with instances of objects. Objects include memory, processes, servers, system, and so on. Instances of objects identify, for example, specific processes.

Once an object and one or more instances of an object are selected, specific counters are selected to be monitored. Counters include such measurements as %processor time, private bytes, available memory, and so on. The counters that are available depend on the object and the instances selected.

Use of counters and the Performance Monitor can provide valuable information to assist in system tuning and to identify bottlenecks in a sluggish system. Use of the Pool Non-paged Bytes counter of the memory object, for instance, can identify memory leaks that contribute to a poorly responsive system.

The following counters give a useful indication of a computer's loading and what is causing it. This is only a partial list of what can be monitored. Depending on your requirements, you might want to perform a detailed review of all of the various counters that are available.

📖 For a list of counters that are useful in diagnosing problems on an IndustrialSQL server, see your *IndustrialSQL Server Administrator's Guide*.

System Counters

The overall performance of the computer can be monitored using the system object. If the computer utilizes multiprocessors, the system object represents them collectively. The are counters for each processor under the processor object.

Counter	Description
% Total Processor Time	Total time for all processors in the system that the processor(s) is busy. This counter does not include time that the processor is running the idle thread waiting for something to do. This counter provides an overview of what the system is doing. It should not be flat-lined at 100% for an extended period of time, although it is not necessarily a problem if certain activities cause this to happen. You will notice a specific pattern for the computer's loading, and a quick check of this variable will tell you what is happening on your system. If this counter is high, further investigation is required to determine that cause. This can be done using other Performance Monitor counters.
File Data Operations/sec	Represents that rate at which the computer is issuing read/write operations to file system devices. This counter provides an overall indication of the disk activity in the system. It can be very misleading as there is no indication if the activity is for single or multiple disks, possibly on multiple controllers. There are two objects more useful for analyzing disk activity: *LogicalDisk* and *PhysicalDisk*, which are summarized later in this section.
System Up Time	Total time that the computer has been running since it was last started. This counter is useful if your department must generate statistics on equipment performance.

Processor Queue Length	Length of the processor queue in units of threads. It is zero unless you are also monitoring a thread counter. It represents the "number" of threads that are waiting for processor cycles. It does NOT include threads that are currently executing. A sustained processor queue length that is greater than 2 generally indicates a processor bottleneck. A processor queue length other than zero is indicating that the system is "too busy" to even initiate another process. It does not give an indication of the performance of the processes that the system is attempting to process.

Processor Counters

Processor counters are very similar to the system counters, except that they are associated with a specific processor in multiprocessor systems. In a single processor system, they will have the same values as the system counters. The *Process Object* allows an individual process on the computer to be investigated. It is possible to determine how much of the overall processor time is being spent on this process, the disk activity it is generating, memory requirements, and so on. It is possible to determine which process(es) is causing a loading on the system by monitoring various process counters with the system counters.

Counter	Description
Interrupts/sec	Number of device interrupts that the processor is experiencing. A value over 1000 may indicate a low efficiency of hardware I/O devices, such as the disk controllers and network cards. If this value changes dramatically without a corresponding increase in system activity, it may be an indication of a possible hardware problem.
% Processor Time	Percentage of elapsed time that all of the threads of this process used the processor to execute instructions. It essentially represents this processes (application) load on the system and provides an indication of "how busy" the machine is. If the *% Processor Time* is high and there does not appear to be a particular process responsible, check the *Interrupts/sec* counter to determine if the processor load is being caused by hardware. **Note** This value does not include the "time" that the processor uses running the "idle" thread while it is waiting for something to do.
Elapsed Time	Total elapsed time (in seconds) the process has been running.

Page Faults/sec	Rate of page faults by the threads executing in this process. This counter can be used to determine which process is placing excessive memory demands on the system. Refer to the Memory object for information on the cause of page faults.
Private Bytes	Current number of bytes the process has allocated that cannot be shared with other processes. If you have determined that your system is short on memory, this counter can be used to determine if a process is failing to free memory as it should.

LogicalDisk Counters

A logical disk represents a partition, stripe set, mirror, or volume set, such as a RAID configuration. A logical disk is assigned a drive letter, such as "C." Logical disk counters differ from *PhysicalDisk* counters because a several logical disks could be located on the same physical disk, or a logical disk my be comprised of several physical disks.

Counters in the *LogicalDisk* object allow you to see the performance of your disk subsystem as you have chosen to configure it. The *PhysicalDisk* object type must also be examined to determine how the hardware components of the disk subsystem are performing.

Counter	Description
% Disk Time	Percentage of time that the disk is busy. There are also counters that can be used to determine whether the activity is caused by Disk Reads and/or Disk Writes. This value can be misleading. If the logical disk that is being examined is a three-disk volume set, the work may be done by multiple drives, which means they are actually only busy part of the time. You should also monitor the *PhysicalDisk* counters to get an accurate view of the disk subsystem.
Avg. Disk sec/Transfer	Average time it takes to process each disk transfer. Higher figures indicate that additional disk channels will help performance.
Free Megabytes	Space (in Megabytes) remaining on the drive.
% Free Space	Percentage of space remaining on the drive.
Disk Queue Length	Number of requests waiting for the drive. This is a snapshot value, not the average over the time period. Typically a value over 2 indicates disk congestion. Increasing the number of disks or obtaining faster disks will help. This value needs to be checked for the *PhysicalDisk* object to see if performance can be improved by changing the configuration of the disks.

PhysicalDisk Counters

This object represents the physical disk and may represent multiple "drives" in Windows NT, depending on the number of partitions.

Note In order to monitor disk activity by using the *PhysicalDisk* counters, it is necessary to enable them. By default, they are turned off because of the approximate 0.1-1.5% load they place on the system. They can be enabled by typing *disperf -y* at the command prompt. It is necessary to reboot the machine before they are activated.

Counter	Description
% Disk Time	Percentage of time the disk was busy servicing read and/or write requests. If this value is consistently high, check the disk queue length. If it is greater than 2, you can be fairly confident that your physical disk is a bottleneck in the system. They may be a number of solutions to your problem, including: changing how your disks are configured, buying additional disks, buying a faster disk, buying another disk controller, buy a faster disk controller, and so on.
Average Disk sec/Transfer	A high value (values greater than 0.3 seconds) may indicate that the disk controller is continually retrying the disk because of failures.
Disk Queue Length	Number of requests that are waiting for the drive. It is a snapshot value and does not represent an average queue length over a time period. If this value is high, you may want to consider changing how your disk subsystem is configured to improve performance. It may be possible to improve the system by changing partitions and/or where applications and data are being stored, assuming that you have a multiple disk system.
Average Disk sec/Transfer	Average amount of time for a disk transfer (either reads or writes) to complete.

Memory Counters

The counters in the *Memory* object provide information on the behavior of the memory in the system, both real and virtual. Adequate memory (both real and virtual) is necessary for good client performance.

A system that is short of real memory will require excessive use of virtual memory (paging file). This in turn creates additional overhead on the disk subsystem, which will adversely affect system performance.

Counter	Description
Pages /sec	Number of pages read from the disk or written to the disk to resolve memory references to pages that were not in memory at the time of reference. This is the sum of *Pages Input/sec* and *Pages Output/sec*. This is the primary counter to observe if you are concerned about excessive paging.
Available Bytes	Amount of free physical memory. If the counter is consistently below 1 MB on a Windows NT Server, paging is occurring and performance will be less than optimal.

Network Counters

The Network counters should be checked to ensure that the network is not a bottleneck in the system. In particular, check the performance of the network connections used by the I/O Servers to ensure that there are no network delays on data throughput.

Counter	Description
% Network Utilization	Percentage of network bandwidth in use. A high figure indicates that splitting the network segment will improve performance.

Paging File Counters

The paging file represents virtual memory and is used as the system runs low on real memory. The size of the paging file is dynamic; the operating system will size the file as needed based on a minimum/maximum size that is defined. If the paging file approaches its maximum size, it is a good idea to find out why and consider raising the maximum.

Counter	Description
% Usage	Percentage of the swap file that is in use.
% Usage Peak	Peak percentage of the swap file that is in use. Increase the paging file size if the usage peak is over 75%.

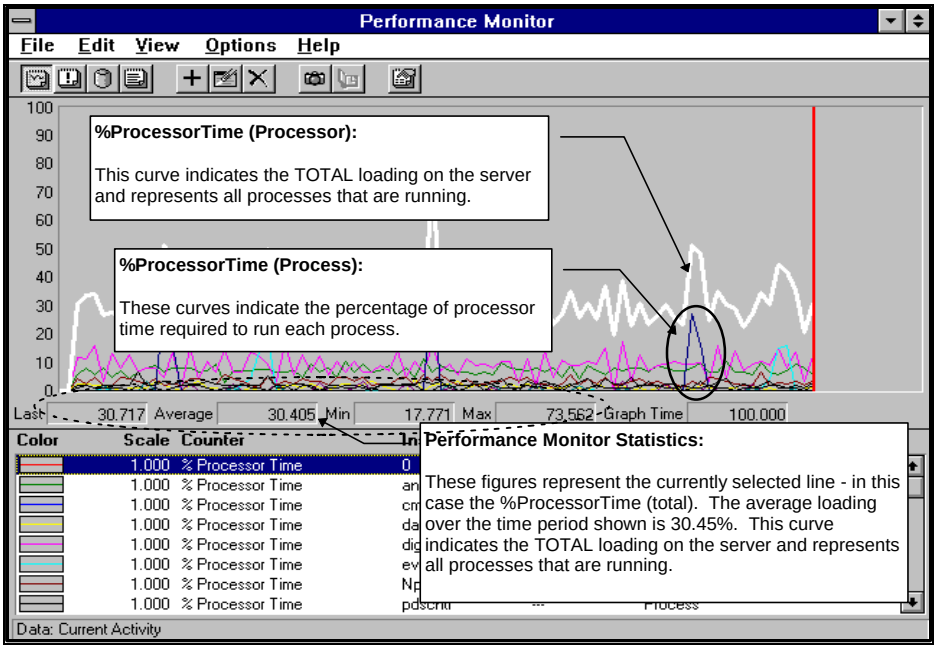
Redirector Counters

The Redirector object manages the network connections to other computers on the network. Counters for the Redirector object provide insight as to how much "work" is being done on a server due to requests from clients.

Counter	Description
Current Commands	Number of requests pending service. If the number of pending requests exceeds the number of network cards in your server by more than two, your server is overloaded. However, requests can also be pending because: • The server with which the redirector is communicating is slower than the redirector. • The network may be experiencing capacity problems. • The redirector is busier than the adapter can handle.
Network Errors/sec	Number of serious network errors per second. Any value other than 0 needs attention. Network errors will also create an entry in the Event Log, which should be checked.

Chart View

The Chart View shows the status of a number of selected counters, such as %Processor Time, %Disk Time, and so on. The Chart View allows the counter values to be displayed over a period of time.

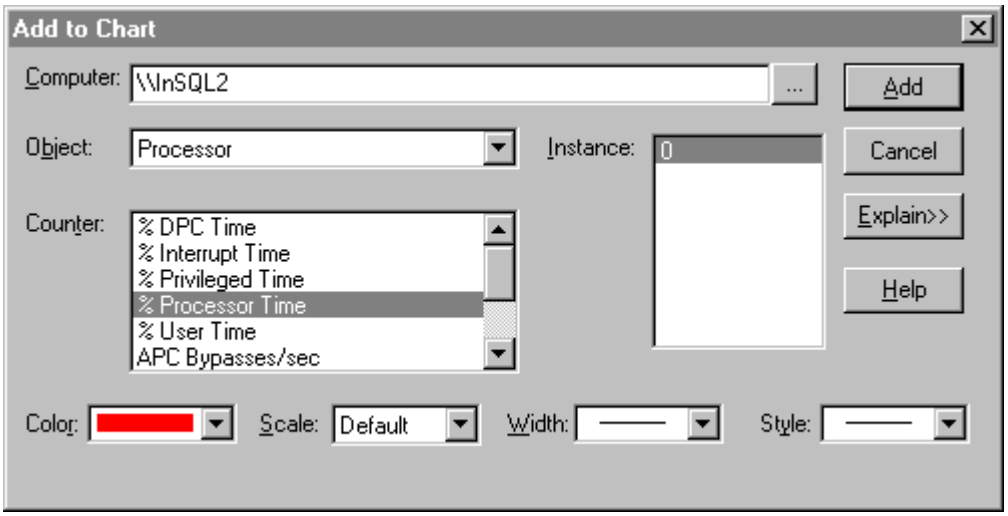


Selecting Objects and Counters

When Performance Monitor is first started, it will default to the Chart View. You must add counters to the chart in order to graphically monitor your local or remote IndustrialSQL Server machine.

➢ **To add a counter:**

1. From the **Edit** menu, click **Add to Chart**. Or click the + toolbar button.
2. The **Add to Chart** dialog box appears.



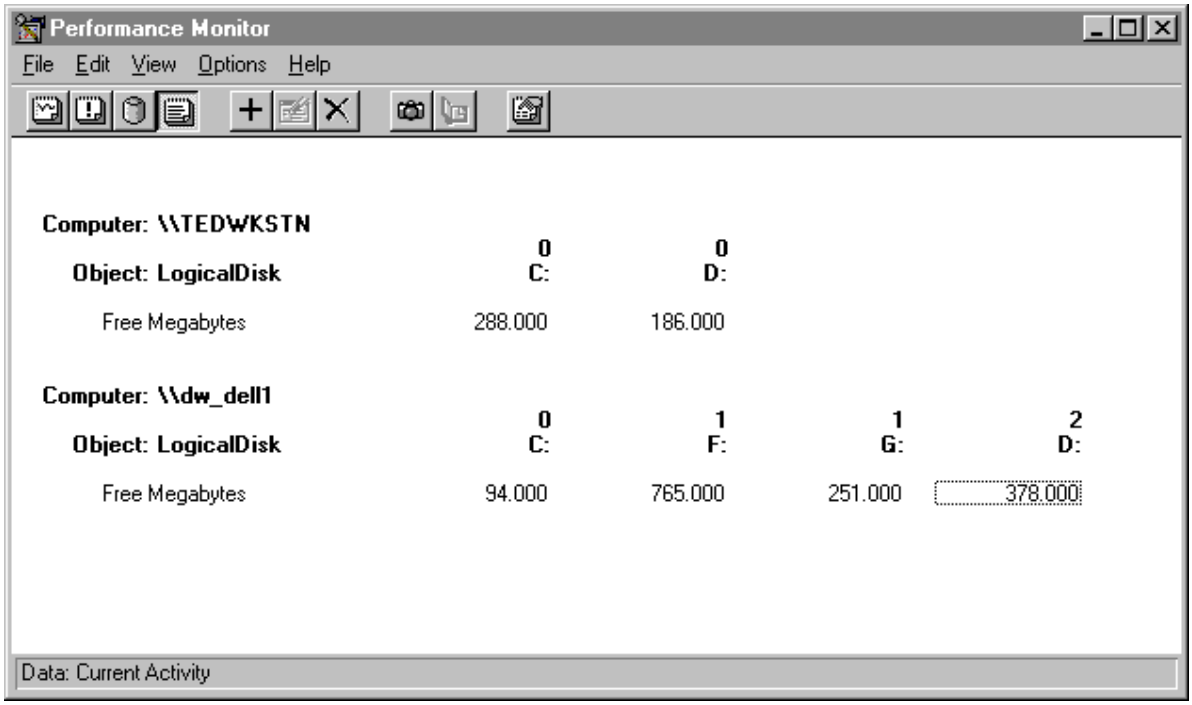
3. By default, the chart will be pointed at your local computer (in this case, a computer named "InSQL2.") To browse for another computer on the network, click the button to the right of the **Computer** text box.

4. Select an object in the **Object** drop-down list box.
5. In the **Counter** list box, click the counter to monitor.
6. Configure the color, scale, width, and style of the line that will designate this counter in the Chart View.
7. Click **Add** to put this counter on your chart.

As you add counters, the chart shows the data dynamically.

Report View

The Report View provides a tabular view of data. For example, a table showing the amount of free disk space (in Megabytes) on each drive of two computers, *TEDWKSTN* and *dw_dell*, can be shown.



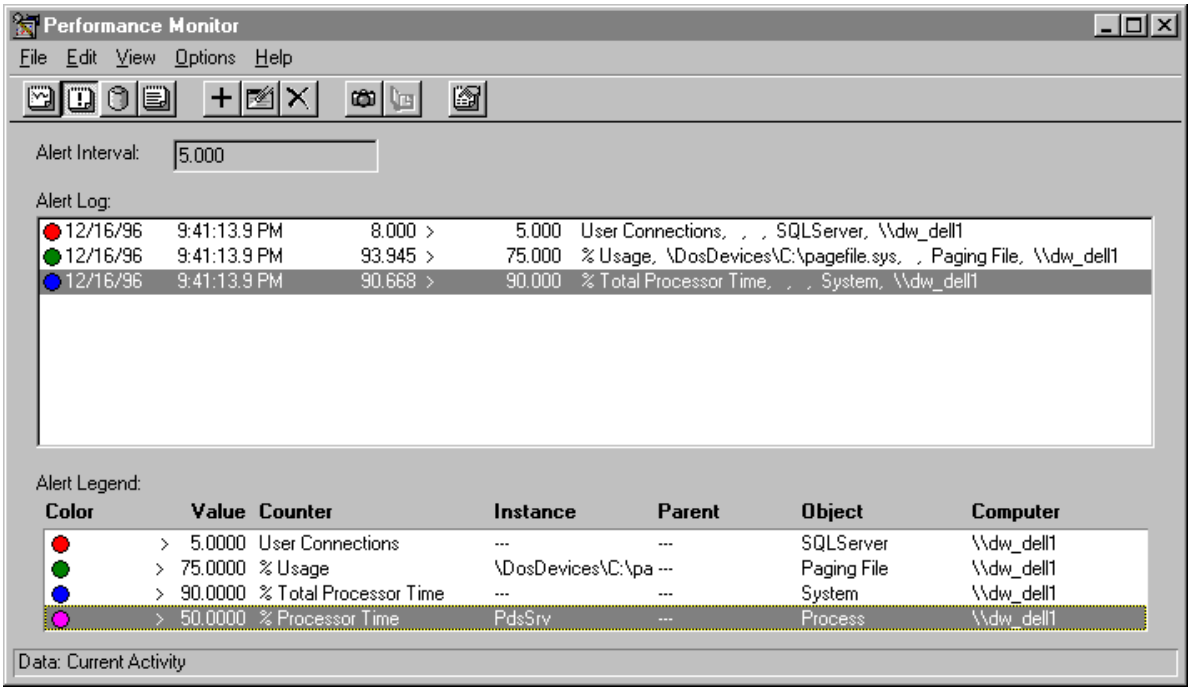
Alert View

Use the Alert View to monitor a server and generate an alert (event) when a certain condition occurs. The Alert View provides a similar functionality to configuring alarms for an InTouch application. An alert can be configured to run a program, generate a record in the event log, send a network message to a designated computer, and so on.

In general,

- Alerts (alarms) can be generated on almost any aspect of a servers operation.
- Alerts can be generated on any computer running the Windows NT operating system.
- Performance Monitor checks alarm conditions based on the alert interval.

Configured alerts are displayed in the bottom half of the alert window. Generated alerts are displayed in the top half.



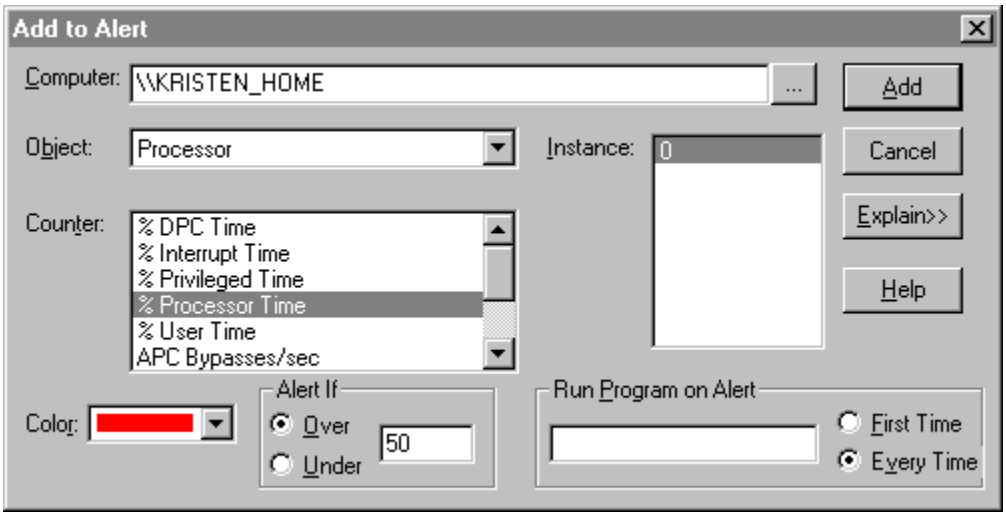
Creating an Alert

You must be in the Alert View to create an alert.

➢ **To create an alert:**

1. From the **Edit** menu, click **Add to Alert**. Or click the + toolbar button.

   The **Add to Alert** dialog box appears.



2. In the **Counter** list box, click a counter.
3. In the **Color** drop-down list box, click a color for the counter.
4. In the **Alert If** group, configure the conditions for the alert. For example, if processor time is greater than 50 percent.
5. To run an application when the alert conditions have been met, enter the name of the application in the **Run Program on Alert** box.
6. Click **Add**.

When an alert condition is met, logs will be generated based on the alert interval shown on the top left of the Alert View window.

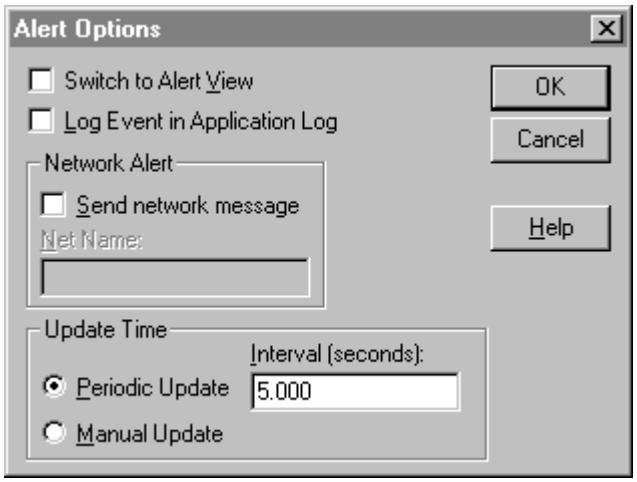
Alert Options

In addition to being able to configure alerts, you can also specify what type of action should take place when the conditions for an alert occurs. For example, you could make the Alert View pop up as the active window, send messages to the Event Log, or even send a message to someone on the LAN to tell them that something is wrong.

➢ **To configure alert options in Performance Monitor:**

1. While in the Alert View, click **Alerts** from the **Options** menu.

   The **Alert Options** dialog box appears.



2. The following options can be configured for alerts.

   Switch to Alert View
   Causes Performance Monitor to become the application with the operating system's focus.

   Log Event in Application Log
   Allows the alert to be written to the Event Log on the system that is running alert. The Event Log can in turn be monitored from any computer on the same network running the Windows NT operating system.

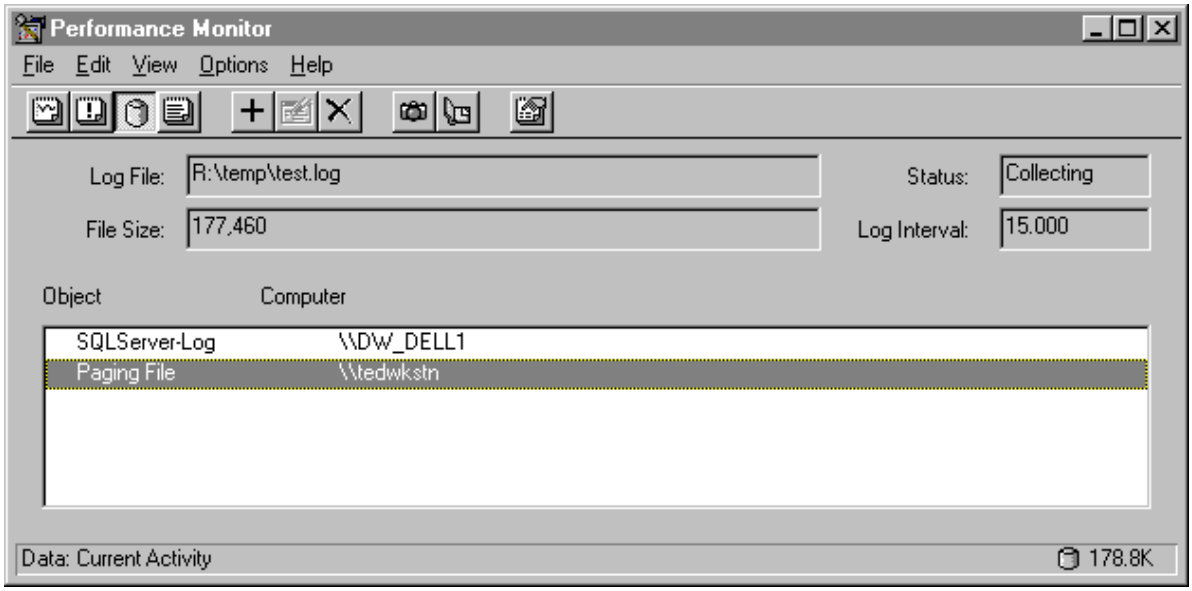
   Network Alert
   Performance Monitor will send a message to any computer specified that is on the network.

3. Click **OK**.

For more information on configuring alerts, see your Microsoft documentation.

Log View

Using the Log View, you can create log files for different counter objects. The data can then be analyzed using Performance Monitor or imported into another application, such as Excel.



Windows NT Event Logs

The Windows NT operating system has been designed to capture information on internal "events." Events may be error messages relevant to some internal system operation, or they may be generated from an application.

The Windows NT event system is comprised of three logs: the Security log, the Application log, and the System log. These logs provide information on any problems that the system has been experiencing. They should be checked regularly to ensure that the system is operating correctly.

Security Log

The Security log records information that may affect the system's security. This information can include who has logged on/off the system, what files have been accessed, and so on. The entries in this log will depend on which of the Windows NT security features have been configured.

Application Log

The Application log records information from the different applications/processes that are running on the server. Information is only logged if the application has been programmed to take utilize the log. Most software that is designed to run on NT is "application log" aware and records event information to it.

System Log

The System log contains entries related to system events such as booting up, initiating services, errors, and so on. If the system determines that there are bad sectors on a hard drive, it will write an entry in the log and also write an entry recording what action it has taken.

Using the Event Viewer

Event Viewer is the Administrative Tool provided with Windows NT for managing the log files. It allows the logs on any NT Workstation or Server to be viewed from any other NT Workstation or Server that is connected via a Network. Event view should be used to check the logs for the following type of messages:

- Error messages from FactorySuite programs
- Error messages from the operating system
- Confirmation messages (that scheduled events have occurred correctly)

There are hundreds of messages that may appear in the logs depending on how your system has been configured and how healthy it is. It is important to know what the messages mean and what action is required. This section shows you how to use the Event Viewer to examine the logs.

Note In order for the Windows NT Event Viewer to be used to monitor IndustrialSQL Server error logs, Registry values for IndustrialSQL Server error logging must be correctly configured. For more information on configuring where IndustrialSQL Server logs error messages, see your *IndustrialSQL Server Administrator's Guide*.

➢ **To start the Event Viewer:**

1. From the **Start** menu in the Windows Taskbar, point to **Programs**, and then point to the **Administrative Tools** group.
2. Click **Event Viewer**.
3. When Event Viewer starts, it may already display log entries.

Log entries are listed from top to bottom in chronological order. Each line will display specifics on which computer these messages came from, why, what time and what day. Log icons represent the level of importance of the message.

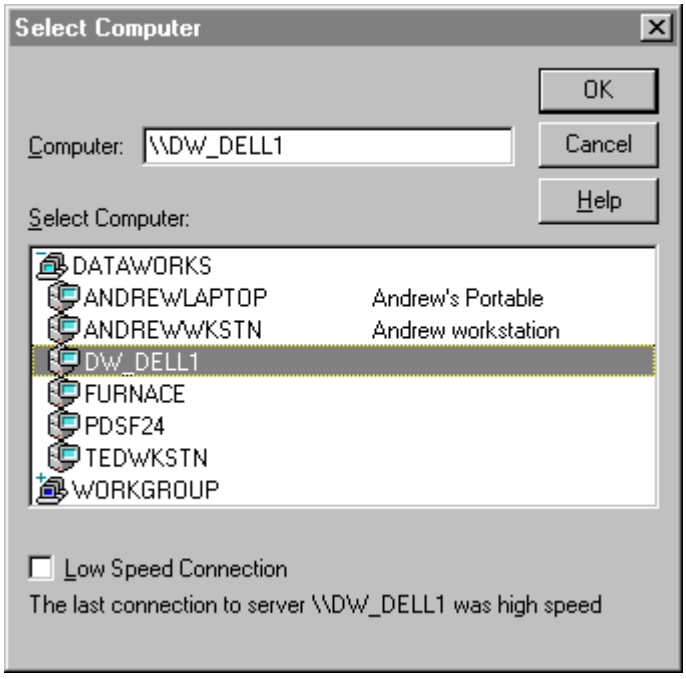
Selecting a Computer

The Windows NT logs that you are able to view in the Event Viewer are determined by which computer you have selected.

Note In order to view the Security log, you must have administrative privileges on the computer that you are connecting to.

➢ **To select a computer:**

1. From the **Log** menu, click **Select Computer**.
2. The **Select Computer** dialog box appears.



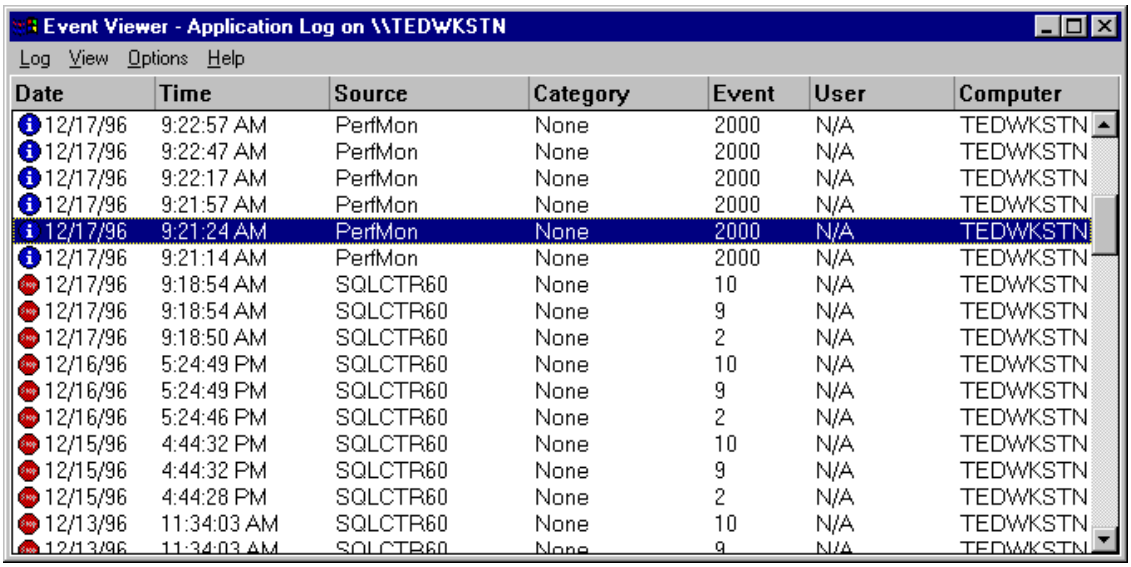
3. Select a computer for which to view log files.
4. Click **OK**.

Selecting a Log Type

The Event Viewer supports three types of log files: system, security, and application. You can configure the Event Log to only show specific types of events. For example, you could configure the Event Log to only show those events associated with an application.

➢ **To select a log type to view:**

1. From the **Log** menu, click the event type (**System**, **Security**, or **Application**).
2. The log for that event type appears in the Event Viewer window.



3. The Event Viewer menu bar displays the name of the workstation for the log. Each event is listed and includes information such as the level of the event (alarm, warning, information), time, and source.

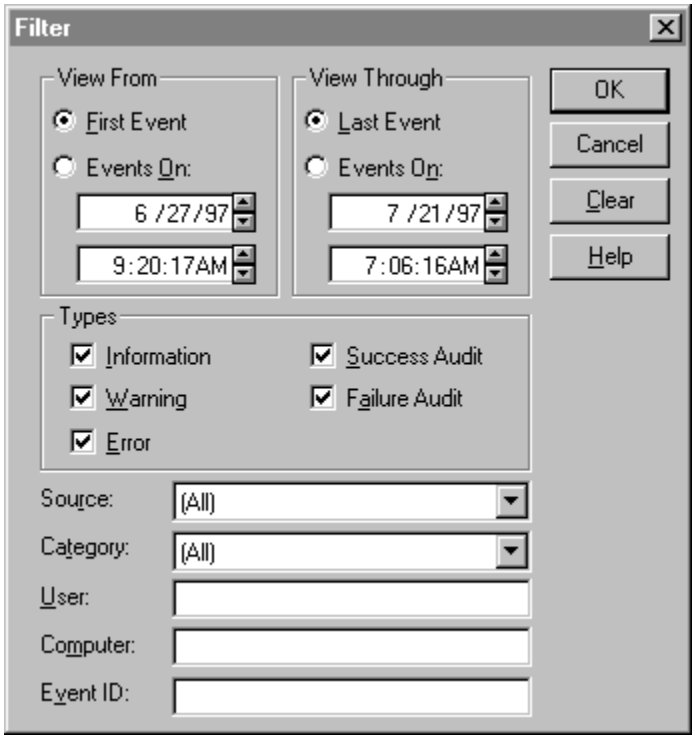
Filtering Events

The Event Viewer includes the options of setting various filters. This allows the log entries that are visible to be easily controlled.

➢ **To filter events:**

1. From the **View** menu, click **Filter Events**.

   The **Filter** dialog box appears.

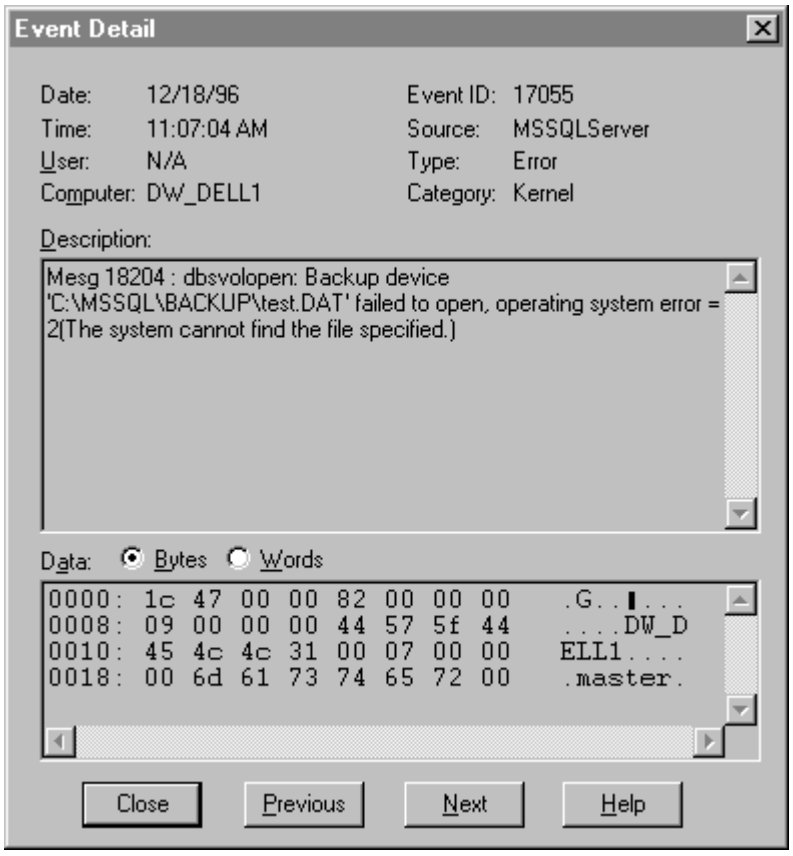


2. Select filter options to control what information will be visible in the Event Viewer log. For more information on configuring filters, see your Microsoft Documentation.

3. Click **OK**.

Viewing Details for Event Log Entries

To view the details for an event log entry, simply double-click on the entry in the Event Viewer window.



The Wonderware Logger

The Wonderware Logger records information regarding the activity performed on the computer. For example, start up data, error conditions, I/O Server information and so on. When you are running a Wonderware FactorySuite component, you should always have the Wonderware Logger running.

The Wonderware Logger is composed of two components: the user interface and the logging process.

- The user interface (WWLOGVWR.EXE) is an application by which a user can view error and informational messages that are sent by FactorySuite components. You can customize the behavior of the logging process (format of the displayed lines, location of the log file, and so on) through this application.
- The logging process (WWLOGSVC.EXE) is a task that runs in the background and actually does the work of processing incoming messages and sending them to the application component to be displayed. It also formats and writes text lines to the log file. The logging process behaves differently when it is run on the Windows 95 operating system than when it is run on the Windows NT operating system.

Note When running any Wonderware software, it is recommended that the Wonderware Logger **always** be running in the background. If a problem occurs with an application, always check the Wonderware Logger for error messages **prior** to calling Technical Support.

Running the Wonderware Logger in Windows NT

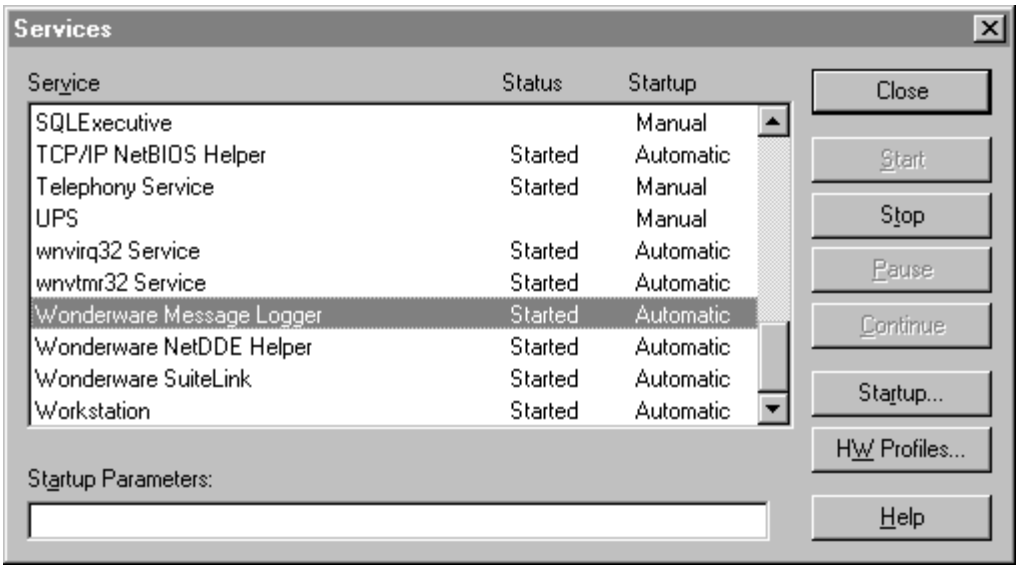
On the Windows NT operating system, the logging process (WWLOGSVC.EXE) runs as a Windows NT service. A service is a process that performs a specific function within the computer system. When the Wonderware Logger is installed as a FactorySuite common component (it is installed automatically), it will start up as a service to allow remote applications to view the local application's logger data.

If, for some reason, the Wonderware Logger stops running, you may need to manually restart it.

➢ **To manually start the Wonderware Logger service:**

1. On the Windows **Taskbar**, click **Start**, point to **Settings**, and then click **Control Panel**.
2. In **Control Panel**, double-click the **Services** icon.

   The **Services** dialog box appears:



3. In the **Service** list, select **Wonderware Message Logger** and then click **Start**.
4. Click **Close**.

Starting the Logging Process from a DOS Prompt

To start the service from the DOS command prompt, type:

```
cd C:\ProgramFiles\FactorySuite\Common
Net Start WWLOGSVC
```

Running the Wonderware Logger in Windows 95

The only difference between running the Wonderware Logger in Windows 95 rather than in Windows NT is the behavior of the logging process (WWLOGSVC.EXE). Since services do not exist on Windows 95, WWLOGSVC.EXE runs as a hidden, background application on Windows 95. It does not have a visible window and doesn't appear in the Windows Taskbar.

When the logging process is installed on Windows 95, it is automatically started when the computer boots up. Thus, this component is active even before anyone has logged on, much like a Windows NT service.

Manually Starting the Logging Process

To manually start the logging process, in Windows Explorer, double-click on WWLOGSVC.EXE in the C:\Program Files\FactorySuite\Common directory. Or, you can simply run the Wonderware Logger application, which will automatically start the logging process.

Stopping the Logging Process

➢ **To stop the logging process:**

1. Press CTL+ATL+DEL.
2. Select Wonderware Logger from the list.
3. Click **End Task**.

Wonderware Logger Gateway

The Wonderware Logger gateway, named WWLOGGER.EXE, is a hidden, background application that runs only on Windows 95. The gateway itself is a 16-bit application and accepts debug input from other 16-bit versions of Wonderware applications, such as NetDDE and I/O Servers. This gateway is responsible for passing these messages along to the new logger process.

Wonderware Logger Files

The first time the Wonderware Logger is started each day a log file is automatically created in the directory in which the Logger is installed. Logger files are formatted as follows:

YYYYMMDD.AEH

where YYYY=year, MM=month, and DD=day

For example, **19971215.AEH**

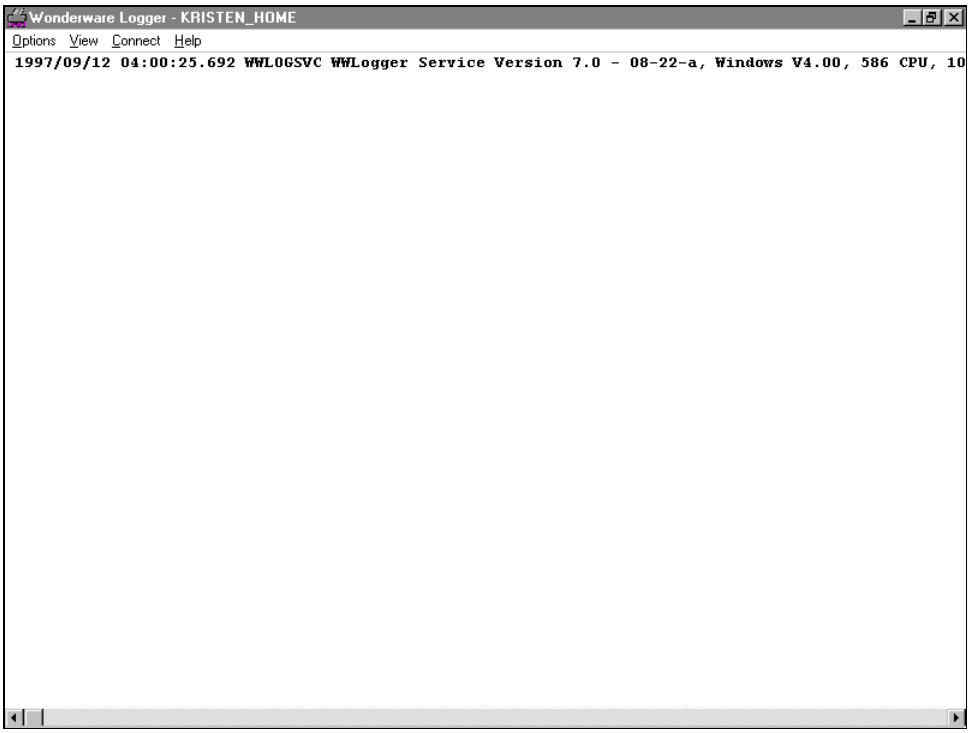
Note The file extension .AEH stands for Alarm Event Handler.

Starting the Wonderware Logger Application

The Wonderware Logger application (WWLOGVWR.EXE) is automatically installed whenever you install a FactorySuite component. This application displays error and other informational messages from installed FactorySuite components.

➢ **To start the Wonderware Logger application:**

1. From the **Start** menu on the Windows Taskbar, point to **Programs**, to **FactorySuite**, to **Common**, and then click **WWLogger**.
2. The Wonderware Logger application starts up.



Configuring General Options

Use the **Options** menu commands for configuring the output device that will display the Wonderware Logger messages, the port being used by the printer directly connected to the computer, and the disk file options, and the computer for which the Wonderware Logger will log messages.

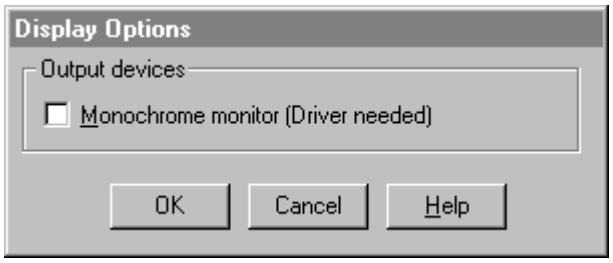
Display Options

Display options are used to specify where the Wonderware Logger will display messages. By default, the Wonderware Logger displays messages on the primary video output.

➢ **To configure display options:**

1. From the **Options** menu, click **Display Options**.

   The **Display Messages** dialog box appears.



2. To display messages on secondary monochrome video output, click **Monochrome monitor**. You will need to install the monochrome monitor driver.

   Note Do not select the **Monochrome Monitor** option without first consulting with **Technical Support**.

3. Click **OK**.

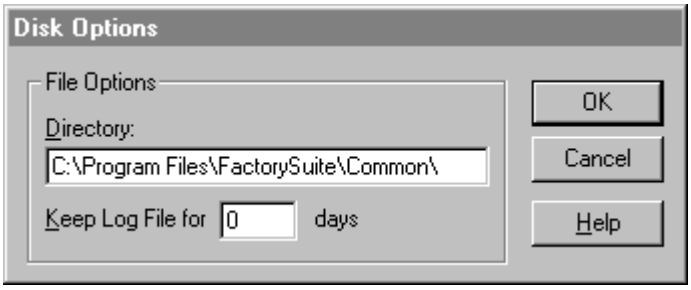
Disk Options

You can specify where the file containing the Wonderware Logger messages will be stored to disk.

➢ **To configure disk options:**

1. From the **Options** menu, click **Disk Options**.

   The **Disk Options** dialog box appears.



2. By default, the Wonderware Logger program automatically saves its log file to the same directory in which it is installed. To specify a different directory, enter the complete path name in the **Directory** box.

3. In the **Keep Log File for XX days** box, enter the number of days that the Wonderware Logger will keep the log files before automatically purging them.

   For example, if **2** is entered, on the fourth day the first day's files are purged. There will actually be three log files; two from the previous day plus one from the current day.

   By default, this field is set to **0**, which acts as "infinity"; the log files are never deleted. Unless this setting is changed, it is recommended that you periodically either purge the older files or archive them off to floppy disk.

4. Click **OK**.

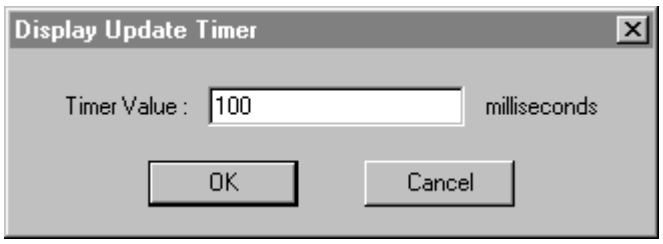
Display Update Timer

The display timer specifies how often the Wonderware Logger queries the logging process for new debug messages. By default, the display in the Wonderware Logger is updated every 100 milliseconds. However, you can specify a different value for the timer.

➢ **To configure the update timer:**

1. From the **Options** menu, click **Display Update Timer**.

   The **Display Update Timer** dialog box appears.



2. In the **Timer Value** box, enter the number of milliseconds that must elapse before the Wonderware Logger display will be updated.
3. Click **OK**.

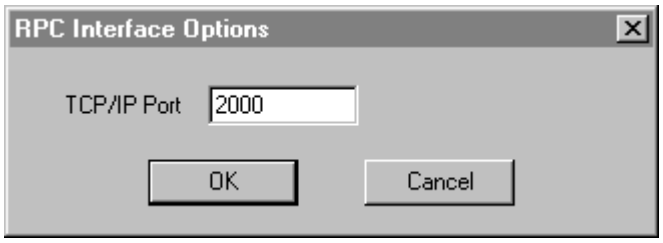
RPC Interface

You can configure the Wonderware Logger to display messages from remote computers on the network. The Remote Procedure Call (RPC) interface TCP/IP port specifies both the port on which the local logging process will listen for connections from remote loggers and the number of the port to which the logger will attempt to connect to when making remote connections.

➢ **To configure the RPC Interface:**

1. From the **Options** menu, click **RPC Interface**.

   The **RPC Interface Options** dialog box appears.



2. In the **TCP/IP Port** box, enter the port number for the remote computer.
3. Click **OK**.

Configuring View Options

Use the **View** menu commands for specifying the format, font, font style, size, and color for messages displayed in the Wonderware Logger.

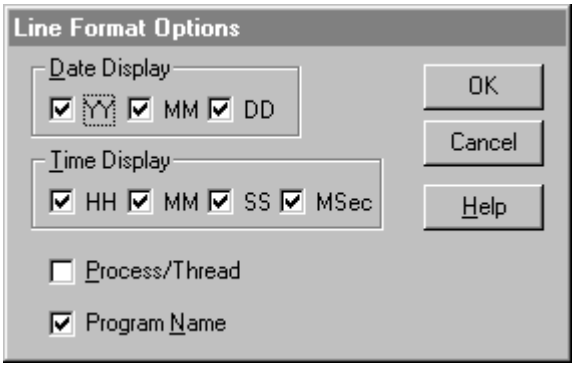
Line Options

Line options are used to specify the display format for messages and information that will be displayed for each message (for example, date, time, program name, and so on.)

➢ **To configure line options:**

1. From the **View** menu, click **Lines**.

   The **Line Format Options** dialog box appears.



2. In the **Date Display** group, select the portions of the date to be displayed for the logged message.
3. In the **Time Display** group, select the portions of the time to be displayed for the logged message.
4. To display the process/thread ID for a program in the message line, click **Process/Thread**.
5. To display the name of the application that is associated with a logged message, click **Program Name**.
6. Click **OK**.

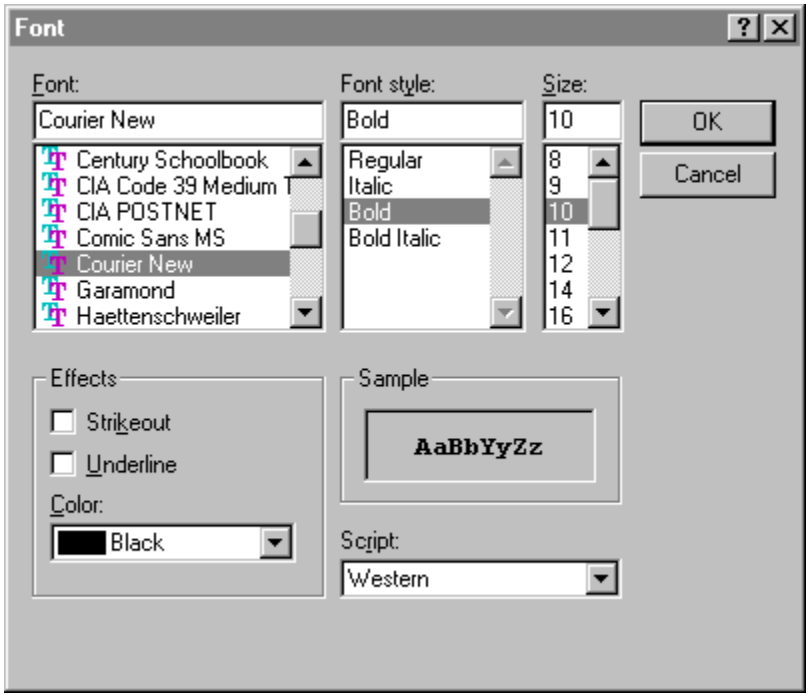
Font Options

Font Options are used to specify the font, font style, color, effects, and sizes for displaying data in the Wonderware Logger window.

➢ **To configure font options:**

1. From the **View** menu, click **Font**.

   The **Font** dialog box appears.



2. From the **Font** list, select a desired font

Note As you configure the font, the **Sample** box will show sample text that reflects your selections.

3. From the **Font Style** and **Size** lists. select a font style and size.
4. If desired, choose an effect for the font.
5. To change the script type, select a new type from the **Script** list.
6. Click **OK**.

Configuring the Network Connection

By default, the Wonderware Logger displays error and information messages that are sent from applications running on the same (local) computer. However, you can specify to have messages from applications running on a remote computer displayed in the Wonderware Logger.

➢ **To use the local connection:**

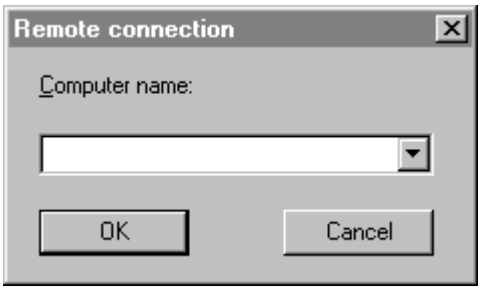
- From the **Connect** menu, click **Local** so that a check mark appears.
- You will see the name of the local computer in the title bar of the Wonderware Logger program.

When you use the local connection, local RPC is used; no network is necessary.

➢ **To configure a remote connection:**

1. From the **Connect** menu, click **Remote**.

   The **Remote Connection** dialog box appears.



2. In the **Computer Name** list, select the name of the remote computer for which you want to log messages.
3. Click **OK**.

You will see the name of the remote computer in the title bar of the Wonderware Logger program.

FactorySuite Component Error Logging

All of the FactorySuite components write error and informational messages to the Wonderware Logger. However, some components have specific error logging mechanisms that are unique to that component. This section describes those component-specific error logging features.

InControl

In addition to the Wonderware Logger, InControl outputs error and informational messages to an Output Window. The Output Window is a small application window that the user can display or hide as needed.

📖 For more information on using the Output Window, see your *InControl User's Guide*.

InControl also writes errors to the Windows NT event log.

IndustrialSQL Server

The IndustrialSQL Server error logging function is controlled by settings within the Windows NT Registry. These settings control the type of error information that is logged and to where they are logged.

The IndustrialSQL Server system stores error logging information in the following locations, depending on the configuration settings:

- Console screen display
- Log file
- The Windows NT event log
- The Wonderware Logger

There are two types of error log files: system and storage. System error logs store information about the general IndustrialSQL Server startup status and system status. Storage error logs store information about storage startup and status.

📖 For more information on error logging in IndustrialSQL Server, see your *IndustrialSQL Server Administrator's Guide*.

CHAPTER 10

Security

This chapter describes the utilities you can use to implement security for components of the FactorySuite.

Contents

Windows NT Security

Components of the FactorySuite are designed to run on the Windows NT operating system. As part of this integration, FactorySuite components can take advantage of the security features of Windows NT, such as user and group security accounts, auditing, and file permissions.

To manage security for Windows NT, you can use the following tools:

Tool	Used To
User Manager	Manage security for a computer running Windows NT Workstation. With User Manager, you can create and manage user accounts, create and manage groups, and manage the workstation's accounts (passwords), user rights, and auditing policies.
User Manager for Domains*	Manage security for domains and computers. This includes creating and managing user accounts and groups, and managing the domain's security policies such as accounts (passwords), user rights, auditing, and trust relationships.
System Policy Editor*	Control user-defined settings in user profiles and to change system configuration settings.
Event Viewer	Monitor security events, which are significant system or program problems that users should be notified about.
DDE Share	Define security restrictions on DDE shares.

* Installed as part of a Windows NT Server installation.

FactorySuite User Account

A service is a process in Windows NT that performs a specific system function. Services can be configured to automatically start up when the computer on which the component is installed starts up. All services run in the "background"; no visible signs of them running appear on the desktop. This eliminates the need for a user to log on to the computer and start the application. Also, a service continues to run as different users log on and off of the computer.

In order to accomplish this, all of the FactorySuite components that run as services use a "master" user account. During installation of a FactorySuite component, you are prompted to enter the details for this FactorySuite user account.

For more information, see Chapter 3, "Installation."

The FactorySuite user account information is encrypted and then stored in the Windows NT Registry under the following key:

HKEY_LOCAL_MACHINE\Software\Wonderware\FS2000\Common\Security

To modify this information, use the Wonderware Service User program.

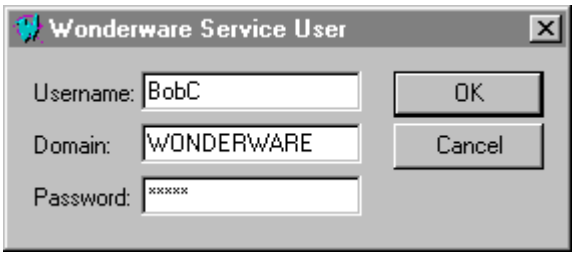
Wonderware Service User

The Wonderware Service User program is used to change the logon account for FactorySuite components that run as services under the Windows NT operating system. In order for these services to run, they require a logon account consisting of a username, domain, and password. All of the FactorySuite components use this user account.

➢ **To change FactorySuite user account**

1. Start the Service User program (WWUSER.EXE).
2. This program is located in the Common directory of the FactorySuite.

   The **Wonderware Service User** dialog box appears.



3. Enter logon parameters for the user account that will have the rights to start and stop FactorySuite components. When the FactorySuite component starts up as a service, this is the account information that will be used.

   Domain
   Name of the domain in which the user account will be validated.

   Username
   Username for the logon account.

   Password
   Password for the logon account.

5. Click **OK**.

Note A similar dialog box is also available from within IndustrialSQL Control. For more information, see your *IndustrialSQL Server Administrator's Guide*.

FactorySuite Component Security Mechanisms

This section describes the various special security mechanisms that are supported by components of the FactorySuite.

Note I/O Servers do not have their own security mechanisms.

InTouch

Applying security to your InTouch application is optional. However, by applying security to your application, you can control specific functions that an operator is allowed to perform by linking those functions to internal tagnames. In addition, you can set up auditing, which will record all alarms/events that occur during the time that a particular operator was logged on to the system.

Security is based on the concept of the operator "logging on" to the application by supplying a name and a password. Therefore, you must configure a user name, password and access level for each operator.

Note There is no integration between Microsoft operating system security and InTouch security.

📖 For more information on managing security for InTouch, see your *InTouch User's Guide*.

Note If you want to configure WindowViewer as a Windows NT service, you must configure Windows NT security. For more information, see your Microsoft documentation.

InControl

Three levels of security access to the InControl environment are available: Administrator, Engineer, and Operator. Multiple levels are used to ensure that only authorized and/or qualified people can interact with a certain aspect of the factory process. InControl is shipped with the Administrator account already configured. The system administrator, with the Administrator security level, assigns a security user name and password for all other users of the system.

Also, InControl allows you to protect program code within an SFC Step from unauthorized changes by locking the algorithms with a password.

Note There is no integration between Microsoft operating system security and InControl security.

📖 For more information on managing security for InControl, see your *InControl User's Guide*.

IndustrialSQL Server

Since IndustrialSQL Server contains an embedded Microsoft SQL Server, it takes advantage of the security features of the Microsoft SQL Server. The purpose of security for a SQL Server is to control who can access certain objects in the database and who can make changes to these objects.

There are three ways that server-level access for the SQL Server can be managed: standard, integrated, and mixed. If standard security is used, each user must provide a login ID and password that is validated by the SQL Server's own security mechanism. For integrated security, users can use their Windows NT login ID and password to log on to the SQL Server. Mixed security uses features of both standard and integrated security. By default, IndustrialSQL Server uses standard security.

Once a user has access to a SQL Server, further security mechanisms control the database that user can access, as well as the types of actions that the user can perform on objects within a database.

IndustrialSQL Server is shipped with several pre-configured login accounts to make managing security easier.

📖 For more information on managing security for an IndustrialSQL Server, see your *IndustrialSQL Server Administrator's Guide*.

InBatch

The InBatch security system consists of a Security Editor, Security Manager, and Security Application Program Interface (API).

The Security Editor is used to add, delete, or change system security parameters, user accounts, security levels, applications, functions, and security level assignments. A default configuration of batch system applications and functions is provided with InBatch. All security information is stored in the security database, and all passwords in the system are stored and transmitted in an encrypted format.

The Security Manager interfaces with the security database and the Security API to permit or deny requests for security clearance that are received from the various batch control system applications. The Security Manager runs automatically as long as the workstation is turned on and operating correctly.

Applications pass information through the Security API when security clearance is required. When needed, the application prompts the operator for their ID and password. The information is compiled into a security request message and sent to the Security Manager along with the application and/or function name, the operator station form where the request was made, and if applicable, the recipe identification code. The Security Manager compares the security request with the information defined in the security database and returns the result to the application making the request.

Security can be configured for the InBatch client environment. InBatch client security is automatically installed when the InBatch Runtime Client software is installed, but must be configured for use.

Note There is no integration between Microsoft operating system security and InBatch security.

📖 For more information on managing security for InBatch, see your *InBatch User's Guide*.

InTrack

There are three aspects of security for InTrack:

- Properties - create users, passwords, put in groups
- ModelMaker
- Runtime

Security properties are the definitions for user accounts in the database. If you are the InTrack administrator or have administrative privileges, you can create users and assign them passwords. You can also assign users to groups. If a user is assigned to a group, that user will automatically inherit all of the privileges of the group.

ModelMaker security defines the privileges of users or groups in ModelMaker. ModelMaker security controls who can view, modify, or add new definitions to the - InTrack process model (that is, make changes to the database).

Runtime security controls what transactions the runtime operator is allowed to perform. For example, you may want to restrict a particular operator from starting any work in-process at a specific operation. If a process associated with an operation requires a specific skill level to perform, a user certification can ensure that any user who performs the process has the necessary skill level. The user certification is defined with an interval attribute that specifies how often a user must be re-certified to maintain the required skill level.

Note There is no integration between Microsoft operating system security and InTrack security.

📖 For more information on managing security for InTrack, see your *InTrack User's Guide*.

Scout

Scout adds a single additional layer of security on top of that provided by the web server on which the Scout Outpost runs. Access to data from Scout VT is controlled by password validation managed by the Scout Outpost. Outpost passwords are configured at installation and the Outpost will exchange data only with requesters that are able to pass the user validity check. This level of protection effectively secures access at the Scout Outpost level.

Data Agent Security

In some cases, data agents provided by third parties (such as Web@aGlance®) may choose to add an additional layer which restricts access to data provided by the agent in addition to that provided at the Outpost itself.

Interactions with NTFS Security

On web servers with NTFS file systems it is possible to apply ACLs (Access Control Lists) to limit access to both files and directories. You can apply an ACL to any document, process graphic, or report that is to be displayed in Scout VT. If Scout VT attempts to access a restricted document, the user will be prompted for username/password in accordance with the Windows NT security model.

Note ACLs can not be applied to Outpost Portfolios, which are portfolios stored on the Scout Outpost for Scout VT users to download.

📖 For more information on managing security for Scout, see your *Scout Online Guide*.

APPENDIX A

Finding More Information

This appendix explains where to get more information on using the FactorySuite. The FactorySuite online books and Help files are described, as well as how to contact Technical Support.

Contents

Online Books

The FactorySuite documentation consists of electronic books designed to be distributed electronically and then printed on a laser printer on an as-needed basis. For this reason, the fonts and layout of the books and documents have been chosen for optimal printing rather than for optimal viewing on-screen. To review the documentation on-screen, simply increase the magnification using the Acrobat magnification box at the bottom of the window. For best results when viewing dialog boxes on-screen, increase the magnification to 125%. **For the highest quality output when printing the online documentation, use a PostScript printer.**

Online Documentation Style Conventions

Throughout the FactorySuite documentation set you will see references to other chapters, sections, and books within the FactorySuite. The symbols shown below, readily distinguish where they will take you in the documentation. When you move the pointer over a reference, it turns into a finger signifying that this is a hypertext link that will "jump" you to the referenced topic, chapter or book. All hypertext links are indicated by a green font. Once you find the information you need, use the Acrobat navigation buttons to return to your original page.

For more information on XXX, see "Name of Section" earlier/later in this chapter. *This is an example of a reference to a section in the same chapter.*

For more information on XXX, see Chapter X, "Name of Chapter." *This is an example of a reference to another chapter in the same book.*

This is a "Tip". *This provides a quick shortcut or hint to make a task easier.*

For more information on XXX, see Chapter X, "Name of Chapter," in your *XX User's Guide*. *This is an example of a reference to another book.*

Note The cross-reference to another book feature (📖) is not active. You must open the document manually.

Table of Contents Links

Table of Contents links are located on the third page of your manual. When you click on a page number, you will jump to the appropriate page for the referenced subject.

Index Links

Index links, located in the last few pages of the book, are similar to and work the same way as Table of Contents links.

Navigation Pane and Thumbnails

In addition to quickly finding information using the Table of Contents links, you can scroll down in the Navigation Pane and double-click on the topic heading to get to a topic in the book. Some topics may have sub-topics, which are expanded and contracted when you click the right arrow. The Thumbnail view is another way moving from page to page or zooming in on a page.

Using Acrobat Reader for the First Time

The Acrobat Reader has a host of features that allow you to quickly find information in a large electronic book with only a few key strokes. Please review the Acrobat Reader online documentation for an overview of its controls, buttons, and menus.

FactorySuite Documentation Set

Depending upon which FactorySuite components you purchased and are licensed for, the following documents are copied to your hard drive: These documents can be launched by double-clicking an icon or file name when using Explorer.

Book Title	PDF Name
FactorySuite Common Books	
NetDDE for the Microsoft Windows Operating System User's Guide	NetDDE.pdf
FactorySuite System Administrator's Guide	FSAdminUG.pdf
InTouch 7.0	
InTouch User's Guide	InTouchUG.pdf
InTouch Reference Guide	InTouchRef.pdf
InTouch Runtime User's Guide	InTouchRuntime.pdf
InTouch SPC Pro	InTouchSPC.pdf
InTouch SQL Access Manager	InTouchSQL.pdf
InTouch Recipe Manager	InTouchRecipe.pdf
Productivity Pack	ProdPack.pdf
IndustrialSQL Server 7.0	
IndustrialSQL Server Getting Started Guide	InSQLGetStart.pdf
IndustrialSQL Server Administrator's Guide	InSQLAdmin.pdf
IndustrialSQL Server Client Tools Guide	InSQLClients.pdf
IndustrialSQL Server Industrial-SQL Reference	InSQLRef.pdf
IndustrialSQL Server Database Schema	InSQLDatabaseSchema.pdf
InBatch 7.0	
InBatch User's Guide	InBatchUG.pdf
InBatch Getting Started Guide	InBatchGetStart.pdf
InBatch SDK Reference	InBatchSDK.pdf
InTrack 7.0	
InTrack ModelMaker User’s Guide	InTrackModMkr.pdf
InTrack Runtime Development User’s Guide	InTrackRunDev.pdf
InTrack OLE Reference	InTrackOLERef.pdf
InTrack Runtime User's Guide	InTrackRuntime.pdf
InTrack Getting Started	InTrackGetStart.pdf
InTrack ActiveX Controls	InTrackActiveX.pdf
InControl 7.0	
Wonderware InControl User's Guide	InControlUG.pdf
GE 90/30 I/O Scanner Board (GE Fanuc Automation NA) User's Guide	InControlGE9030UG.pdf
InterBus-S I/O Scanner Board (Phoenix Contact) User’s Guide	InControlInterbusPhoenixUG.pdf
InterBus-S SC/I-T G4 I/O Scanner Board (Phoenix Contact) User's Guide	InControlInterbusPhoenixG4UG.pdf
Allen-Bradley 1784 KTX I/O Scanner Board (Allen-Bradley Company) User's Guide	InControl1784AB.pdf
DeviceNet I/O Scanner Board (S-S Technologies Inc.) User's Guide	InControlDeviceNetSSUG.pdf
PROFIBUS I/O Scanner Board (Synergetic Micro Systems Inc.) User's Guide	InControlProfibusSMSUG.pdf

PCDIO I/O Scanner Board (Industrial Computer Source) User's Guide	InControlPCDIOUG.pdf
GE Genius I/O Scanner Board (GE Fanuc Automation NA) User's Guide	InControlGEGeniusUG.pdf
Wonderware InControl SuiteLink User's Guide	InControlSuiteLinkUG.pdf
Opto 22 Pamux Interface User's Guide	InControlPamuxUG.pdf
Wonderware InControl I/O Connectivity Toolkit User's Guide	InControlIOConnUG.pdf
I/0 Servers 7.0	
Allen-Bradley 1784-KT User's Guide	IOSrv_AB1784KT.pdf
Allen-Bradley Ethernet Direct User's Guide	IOSrv_ABTCP.pdf
Siemens SINEC H1 CP 1413 User's Guide	IOSrv_H1CP1413.pdf
Siemens SINEC L2 FDL A2 User's Guide	IOSrv_L2FDLA2.pdf
Modicon MODBUS Plus User's Guide	IOSrv_MBPLUS.pdf
OMRON Host Link User's Guide	IOSrv_OMRONHL.pdf
Square D SY/ENET User's Guide	IOSrv_SYENET.pdf
Siemens 3964R User's Guide	IOSrv_S3964R.pdf
Mitsubishi A-Series User's Guide	IOSrv_MELSECA.pdf
Siemens SIMATIC NET S7 User's Guide	IOSrv_S7.pdf
Reliance AutoMax PC Link User's Guide	IOSrv_AUTOMAX.pdf
Square D SY/LINK User's Guide	IOSrv_SYNET.pdf
Square D SY/MAX Point-to-Point User's Guide	IOSrv_SYMAX.pdf
OPCLink User's Guide	IOSrv_OPCLINK.pdf

Online Help

Most of the FactorySuite components have online Help systems. You can access online Help from the **Help** menu in an application.

Many applications also support context-sensitive Help. To use context-sensitive Help, simply click on the application program element for which you want Help (for example, a dialog box, property panel) and press **F1** on your keyboard. A Help topic related to using that specific program element will appear.

You can also access context-sensitive Help for menu items in IndustrialSQL Server client applications. Simply highlight the menu item with the mouse cursor and press **F1**.

Note "What's This?" Help, commonly used for applications written for the Windows 95 operating system, is not implemented in this release.

The following symbols are included in the Help files:

Symbol	Denotes
	A reference to another Help topic.
	A "Tip". Tips explain a quick shortcut or hint to make a task easier.

Technical Support

Wonderware is committed to excellence in service worldwide. Our goal is to provide you with professional assistance in the use of our software, wherever you are located. This section provides information about the various technical support programs and how to contact Wonderware Technical Support and our network of Wonderware distributors for support.

Who to Call for Assistance?

For technical assistance on installing or using the components of Wonderware FactorySuite, call your **local Wonderware distributor**. Your distributor is trained to provide personalized local support for FactorySuite.

To determine your local distributor, call the nearest Wonderware regional sales office:

Wonderware Corporation
Irvine, California U.S.A.
714-727-3200

Wonderware Mexico
Mexico City, Mexico
(Contact Wonderware in Irvine, CA)

Wonderware Argentina
Buenos Aires, Argentina
541-328-8150

Wonderware GmBH
Munich, Germany
49-89-450558-0

Wonderware Japan
Tokyo, Japan
81-3-3275-0699

Wonderware Singapore
65-276-1508

Wonderware of Taiwan, Inc.
Taipei, Taiwan
886-2-7209366

Wonderware Italy
Milan, Italy
39-332-298-444

Wonderware Korea
Seoul, Korea
82-2-565-3807

Wonderware Technical Support Programs

To compliment support provided by your distributor, Wonderware offers three Technical Support software maintenance programs for the FactorySuite: **Basic Support**, **Comprehensive Support** and **Site Support**.

Basic Support is free with your purchase of FactorySuite and other Wonderware products. Basic Support customers can contact Wonderware Technical Support through our Basic Support phone system at (714) 727-3299. You may either leave us a detailed message (where a Technical Support Engineer will respond to you within the next business day) or transfer to your local distributor.

Comprehensive Support is our annual subscription program for individual FactorySuite development, server and toolkit licenses which offers all the benefits of Basic Support, plus: fast telephone access to a Wonderware Certified Support Provider (toll-free in the U.S. and Canada at 800-WONDER1), regular shipments of the Knowledge Base CD, version support of new FactorySuite releases, priority e-mail access, and other benefits.

Site Support is our all-inclusive annual subscription program that covers support for all FactorySuite licenses at a single site, including development, runtime, server and toolkit licenses. It includes all of the benefits of Basic Support and Comprehensive Support, plus you may receive the latest software CD-ROM releases, as well as convert from existing hardware keys to our keyless security system for all FactorySuite development, runtime, server and toolkit licenses that are covered under your Site Support agreement.

For more information on these support programs, contact your local Wonderware distributor.

Wonderware Electronic Support Services

The following describes the Wonderware Technical Support wide range of electronic support services to assist you in using FactorySuite:

Technical Support Web Site (http://www.wonderware.com/support) – After you register on the Technical Services web site, within one business day, you will be granted access to a wide range of valuable support services, including our Web-based discussion forums. Comprehensive Support and Site Support customers may also post their issues directly in Wonderware Technical Support's call tracking system where it will automatically be assigned to a Technical Support Engineer.

E-mail – When sending an e-mail to Wonderware Technical Support, include your name, company, e-mail address and your customer userid, if known. If this information is not included, it may delay our processing your request. Basic Support customers may e-mail Wonderware Technical Support at support@wonderware.com. Comprehensive Support and Site Support customers may receive priority e-mail access at compsupp@wonderware.com.

WonderFax Service (714) 450-5050 – The WonderFax fax-on-demand service is available 24 hours a day, seven days a week at no charge. Use your touch-tone telephone to request Technical Support and Training documents to be faxed to you. This is an excellent resource which can answer many of the most common questions or problems that you may have. Be sure to request the WonderFax catalog the first time that you call.

Wonderware Bulletin Board Service (714) 727-0726 – FactorySuite customers can dial into the Wonderware BBS to download patches or fixes for FactorySuite components, and I/O Server and InControl I/O Driver updates (Comprehensive Support and Site Support customers only).

Fax Support (714) 727-9733 – FactorySuite customers can send questions to Wonderware Technical Support by fax at any time. A Technical Support Engineer will respond to you within the following business day.

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