"The FactorySuite A2™Advantage" Architecture by ArchestrA™

- *Dramatic Engineering Savings*
- *Lower Cost of Ownership*
- *Agility to Respond and Grow*
- *Uncompromising Openness*

The Industrial Application Server (IAS) introduces a new era in engineering productivity and scalability for industrial automation applications. It provides an infrastructure for simplifying the development, deployment, maintenance and administration of distributed automation applications. The Industrial Application Server provides a new tier of real-time data acquisition, alarm and event management, data manipulation services, and collaborative engineering capabilities, which have been designed from the ground up for use in industrial automation applications.

The FactorySuite® Industrial Application Server enables manufacturers, OEMs and systems integrators (SIs) to significantly lower engineering, ownership and maintenance costs for automation systems, while giving users the freedom to architect automation systems without compromising their ability to respond to new demands.

The Industrial Application Server is a powerful new applications delivery platform built on Invensys's ArchestrA™ architecture. The comprehensive ArchestrA plant automation and information architecture is designed from the outset to extend the life of legacy systems by leveraging the latest software technologies. Whether automation applications are in discrete manufacturing, process plants, remote SCADA operations, utilities or any hybrid combination of these types of operations, Architecture by ArchestrA has it covered.

PRODUCT HIGHLIGHTS

- ■ Distributed Peer-to-Peer Architecture
- ■ One Global, Networked Namespace
- ■ Integrated History, Scripting, Alarming and Security
- ■ Intuitive Multi-User Development Environment
- ■ Component-Based Plant and Application Model
- ■ FDA 21 CFR Part 11 Ready
- ■ Built On ArchestrA Software Architecture

Every system in your plant, working in concert.™

EVOLUTION OF FACTORYSUITE

The FactorySuite vision, first presented in 1996, is to provide the industrial automation world with a full range of easy-to-use, integrated and scalable industrial-strength software tools designed to maximize engineering productivity. Wonderware continues the evolution of the FactorySuite product line with the addition of the FactorySuite Industrial Application Server, built on ArchestrA architecture. The Application Server is a significant new offering in a family of uncompromising software solutions from Wonderware. The FactorySuite Industrial Application Server is the foundation of an

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Powering intelligent plant decisions in real time.

extensive distributed and scalable automation environment that continues the Wonderware tradition of unmatched power and ease of use.

Combined with Wonderware's well-renowned InTouch® HMI software, connectivity to up to 800 proven I/O Servers and new ArchestrA based DataAccess Servers, InBatch™ batch processing software, the IndustrialSQL Server™ plant historian, the SuiteVoyager™ industrial portal and a broad line of advanced reporting and analysis clients, the Industrial Application Server sets a new standard for engineering productivity in industrial automation.

CAPABILITIES THAT DRIVE COST SAVINGS

Engineering Savings through Re-Use

The FactorySuite Industrial Application Server significantly lowers engineering development costs through its component-based distributed architecture. Engineering is significantly lowered through the use of reusable application objects that represent plant devices and contain all the associated application logic. Application objects can be easily built, replicated and assembled, drastically reducing engineering setup and deployment costs, while reducing system start-up time and risk.

Lower Cost of Application Ownership

The use of the FactorySuite Industrial Application Server enables companies to dramatically lower the lifecycle cost of owning and maintaining automation applications, while extending the useful lifespan of an automation system. The Industrial Application Sever achieves lower ownership costs through numerous capabilities designed into the architecture, which allow for remote application deployment and maintenance, online upgrades and expansion, remote system diagnostics, and change propagation.

Agility to Respond

The FactorySuite Industrial Application Server provides companies with the agility and flexibility to cost-effectively respond to changes in automation system requirements, while protecting initial engineering investments. The Industrial Application Server's component-based architecture and scalable and freely distributed automation environment gives engineers the flexibility they need to enhance, modify or re-architect their automation application topology without the cost of re-engineering. These capabilities allow users to respond to demands for increased performance, capacity expansion and retrofits without being constrained by prior application deployment decisions.

Savings through Extensibility

The Industrial Application Server presents an open and flexible framework that provides engineers with the capability to extend application components as well as communications and device integration with toolkits that broaden functionality, create domain-specific application components and generate field device interfaces. These extensibility capabilities save significant engineering time. This is a great advantage because it allows engineers to concentrate on applying their domain expertise to building applications, thanks to the Industrial Application Server's powerful distributed architecture, development environment and core services.
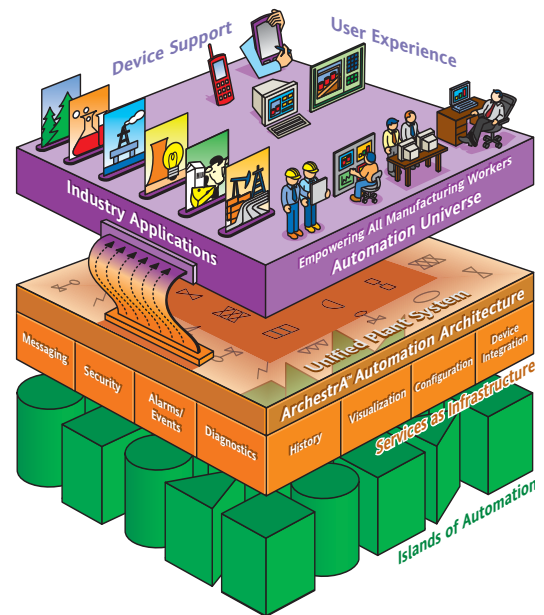
THE IAS ARCHITECTURE

A Robust Industrial Framework

The Industrial Application Server leverages ArchestrA technology and provides users with an extensive set of core automation software services designed to meet the needs of industrial automation applications across all industries. It provides the following set of services:

- Event-based data processing, scripting and calculation capabilities
- Deterministic processing of scripts and functions
- Distributed peer-to-peer computing architecture
- Alarm and event management and historization
- Data and device-level security definition
- Reporting and ad hoc query capability

- Support for OPC, SQL and other communications standards
- Centralized system diagnostics from any workstation
- Online maintenance and expansion
- Component-based development model

Distributed Peer-to-Peer Communications

The Industrial Application Server provides users with complete flexibility in architecture choices, both during the initial system design phase and throughout the lifetime of an installed system. The Industrial Application Server provides users with the capability to develop centralized applications or highly distributed peer-to-peer applications through the ArchestrA architecture, which is based on reliable, distributed peer-to-peer communications. Each workstation or server in the application is part of a global, networked namespace that allows the application to be freely distributed to all the workstations in the system, without limitation or concern for the specific location of data sources. This vastly simplifies the maintenance process, as changes in data sources or system deployment models do not require changes to other system components.

Scalability

The Industrial Application Server provides a scalable and integrated architecture to meet the needs of small, simple applications all the way up to highly challenging manufacturing information management systems. The Industrial Application Server provides the capability to quickly and easily deploy new nodes and functions, providing exceptional scalability.

Too often, an application's architectural structure locks engineers into a single topology. Such inflexible architectures hinder a user's ability to improve poor system performance or respond to changing automation system requirements. The Industrial Application Server resolves the problems associated with scaling automation applications because there are no limitations on system size and performance issues are easily addressed through the introduction of new nodes. New workstations and any data points defined are automatically integrated into the initial application through the plant model. The common distributed peer-to-peer namespace means that all information is shared between the nodes without the user having to perform any additional engineering or configuration.

Centralized Architecture or . . .

Distributed Peer to Peer Architecture

Maintain Same Global Networked Namespace
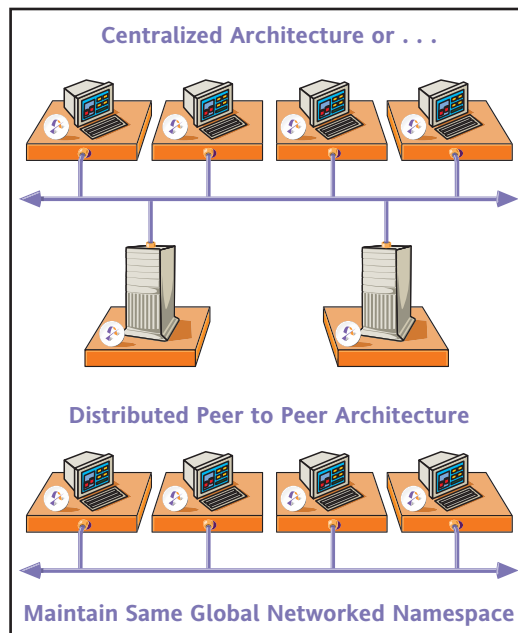
Deterministic Runtime Processing

The Industrial Application Server's runtime application and system infrastructure components can be managed and deployed from a central or remote location. Deployed application engines, the core processing units of the Industrial Application Server, process data and scripts in a deterministic order, much like a PLC or controller, ensuring predictable system behavior and performance.

INTUITIVE ENGINEERING ENVIRONMENT

Industrial Application Server systems are developed using the FactorySuite A[2] Development system. The Industrial Application Server Integrated Development Environment (IDE), delivered as part of the FactorySuite A[2] development system, is powerful and easy to use. All application components are configured and deployed from the IDE to target workstations and servers. The Integrated Development Environment is a multi-user development tool and provides the capabilities to configure, edit and maintain all application-specific components for systems based on the Industrial Application Server.

The IDE also provides the engineer with multiple views of the automation project, allowing for better management of the system. The engineer can view and configure the system from an object relationship, plant model and/or deployment perspective. These complementary system views empower the engineer to rapidly make modifications,

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while understanding how those changes will impact the overall application architecture and the relationships between objects within the system.
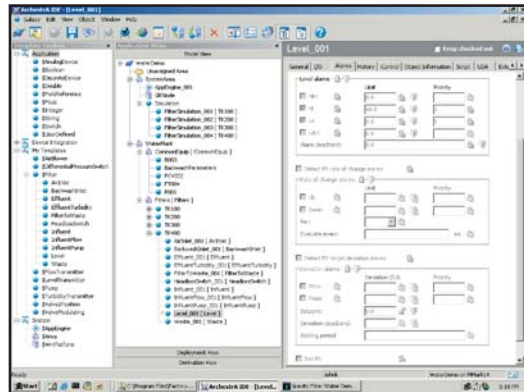

(IDE) Integrated Development Environment

Engineering Re-Use through Application Components

The Industrial Application Server's component–object architecture significantly enhances productivity. The component-object model facilitates the development of reusable application objects that represent plant devices.

Application Objects built within the FactorySuite IDE contain all the necessary elements associated with an automation device, such as historization parameters, tags, alarm and events, documentation, scripts, security, and communication parameters. A library of reusable component templates can be built, replicated and deployed, enabling rapid application development. Each component template supports change propagation so that a change in one of the elements can be automatically propagated to all affected components—or select ones— saving valuable engineering time and money.
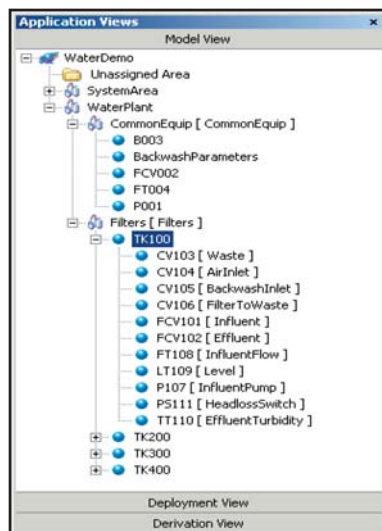

Plant Model Achitecture

Users can build libraries of pre-engineered application objects into templates that leverage best practices and company engineering standards. The resulting flexible application objects can contain knowledge and application code that represent physical plant equipment, supervisory automation strategies or higher-level production strategies. Template libraries can turn application engineering into an assembly process, rather than a programming exercise, enabling dramatic productivity gains that increase from project to project

Multi-Developer

The IDE is a multi-developer environment that enables companies to leverage their engineering resources, with multiple engineers working simultaneously on the same project. The IDE supports multiple developers through the use of efficient check-in/check-out procedures and provides an audit trail of revision history for each application component that includes user ID, time and date stamp, and a detailed summary of the changes made. The entire application can be base-lined for version control because the application configuration is saved in a central project repository that is based upon SQL Sever Database. The check-in/check-out procedures also allow engineers to take components with them when they travel or leave the site, giving the engineer ultimate flexibility.

Powerful and Easy Scripting with QuickScript.NET

The Industrial Application Server supports and extends Wonderware's QuickScript with QuickScript.NET. The Industrial Application Server extends this easy-to-use scripting language with support for almost any data type and provides engineers with unlimited capability to address the most challenging applications. QuickScript.NET's libraries of new scripting functions can be created in other .NET development environments, such as Microsoft's VisualBasic.NET or Visual C.NET, providing flexibility and power. QuickScript.NET also supplies deterministic execution orders and the data traceability required for critical automation environments. Compatibility with standard InTouch QuickScript preserves engineering investments by re-using existing applications scripts.
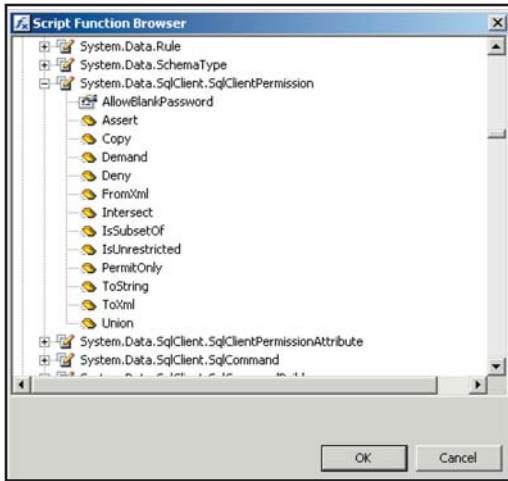
Quick Support – NET Scripting

InTouch Integration

The Industrial Application Server uses Wonderware's popular InTouch HMI for process visualization. InTouch 8.0 or InTouch View HMI workstations can be easily engineered to leverage the common automation services and distributed architecture of the Industrial Application Server. They can also benefit from the IAS security model, component architecture, application logic, scalability, diagnostics and networked namespace. In addition, the Industrial Application Server protects and extends previous InTouch engineering investments with the capability to re-use scripts, tags and communications from existing InTouch applications, providing for powerful co-existence and easy migration.

Internationalization Support

The Industrial Application Server enables companies to leverage multiple engineering teams with full internationalization support, providing the ability to develop a single application in multiple languages and deliver the final applications in the local language through a set of dictionary services. This remarkable capability empowers engineers to work on automation projects in their local languages, and to assemble applications in the language of the country to which the application will be deployed.

COMMUNICATIONS AND ALARMING

Device Integration Communications

Wonderware, together with more than 100 third-party companies, offers the largest selection of 32-bit I/O servers for hundreds of the most popular control devices, PLCs, RTUs and DCS, including Rockwell, Siemens, GE, Schneider, Foxboro, Fisher-Rosemont, Honeywell and many more. The Industrial Application Server gives users open access to all the latest device communications protocols, using Wonderware's SuiteLink™ protocol or DA Servers, OPC or standard DDE, FastDDE or NetDDE.

Wonderware® communication servers provide users with connectivity software solutions that significantly reduce the need for additional hardware and restrictive vendor-supplied middleware. Several communication options enable connectivity at any level, with any manufacturer.

SuiteLink Severs

The Wonderware SuiteLink protocol provides highly reliable, easy-to-use performance-optimized data communication in environments based on the Windows NT® and Windows® 2000 and XP operating systems. The support of time stamps and quality stamps allow the deployment of large distributed systems.
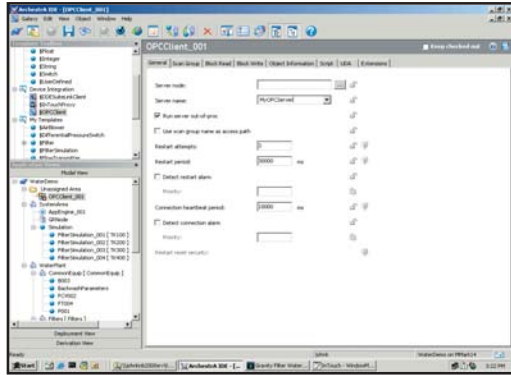
DA Servers

The new DataAccess Servers (DA Servers) are Wonderware's next-generation communication servers, designed to provide high performance, diagnostics, remote configuration and native integration with the ArchestrA architecture. DA Severs also provides connectivity between a variety of modern DDE, SuiteLink or OPC-based client applications running under Microsoft Windows 2000 and XP.

DA Servers can also operate in either stand-alone mode—with any existing FactorySuite 2000 version 7.11 or 8.0 client components—or with Invensys™ or third-party ArchestrA offerings, through the use of device integration objects.

OPC

Wonderware supports the latest OLE for Process Control Specification version 2.05 with the introduction of DA Servers. DA Servers can provide information to any OPC client, including third-party OPC-enabled software. Plus, Wonderware's OPCLink and InControl™ software provide additional OPC client and server connectivity


Supports OPC and Over 800 I/O Servers

DDE / FastDDE / NetDDE

Wonderware also offers support for Microsoft® DDE and NetDDE, as well as Wonderware FastDDE protocols, which support time stamp and quality with the FastDDE protocol.

High-Performance Distributed Alarm Sub-System

The Industrial Application Server supports a fully distributed alarm sub-system, which greatly improves the quality of alarm information, while reducing system configuration time. This powerful alarm sub-system supports three alarm-acknowledgement models, condition-oriented alarms, event-oriented alarms and expanded summary alarms to easily manage and view alarm conditions. Step-by-step Wizards and easy-to-use graphical user interfaces (GUIs) make alarm configuration simple to implement.
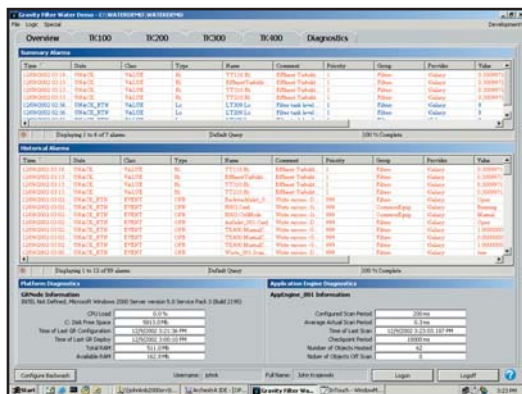
Powerful Distributed Alarming

Alarm Flexibility

Alarms can be enabled or disabled directly or indirectly under full control of the Industrial Application Server. Alarming can be based at any level of your application object hierarchy, giving you full control of how to directly map alarms to match your plant structure. Alarm suppression can be applied to single alarm classes, objects or groups to prohibit the display of alarm information on a specific view node. System-wide disablement can also enable users to block all alarm activity during start-up.

Alarm Architecture

The distributed alarm sub-system provides flexibility in setting up alarm providers and consumers. Alarm providers are responsible for determining alarm conditions and publishing alarms to the distributed alarm sub-system. Consumers are client entities who subscribe for and receive alarm information from the distributed alarm sub-system.

SECURITY CAPABILITIES

FDA 21 CFR Part 11

The FactorySuite Industrial Application Server approach to security is ideal for industrial applications that are impacted by regulatory and FDA 21 CFR Part 11 requirements. For it offers unparalleled robustness and engineering cost savings. Engineering FDA-regulated applications is now simpler than ever with support for automated configuration audit trails, secure writes and verified reads.

The Industrial Application Server provides data model security at the lowest possible level of granularity and extends the Microsoft Windows security model down to the physical equipment layer, providing security attributes that specifically match factory requirements.

At this level, data is arranged according to plant area. Users will enjoy the same centralized, easy log-in procedures that the Microsoft model offers, but the Industrial Application Server expands upon them after clients enter the system. Carrying the security model down to the equipment and associated automation levels provides much greater granularity of secured access.

Examples of security settings include:

- Alarm limits, tuning parameters, change privileges
- Security settings at user, device and physical locations
- Template configuration and modification tracking

INTEGRATED HISTORY

The FactorySuite Industrial Application Server leverages Wonderware's highly regarded IndustrialSQL Server real-time plant historian to acquire store and retrieve production, process and material history. With the addition of the Industrial Application Server, it's much simpler to configure and maintain the plant historian. Historical logging requirements are defined within each application object template and are an integral part of that object. Based on these definitions, the Industrial Application Server automatically configures the IndustrialSQL Server historian to enable immediate logging of data and delivery of plant information.

APPLICATION MAINTENANCE

Online Maintenance and Expansion

With the Industrial Application Server, application upgrades and expansions no longer require shutting down and restarting the entire system. Upgrades can be performed on portions of the application without bringing the entire system down, enabling companies to lower maintenance costs and respond quickly to changes or problems. In addition, new plant equipment or workstations can be easily added without disrupting the rest of the line or plant.
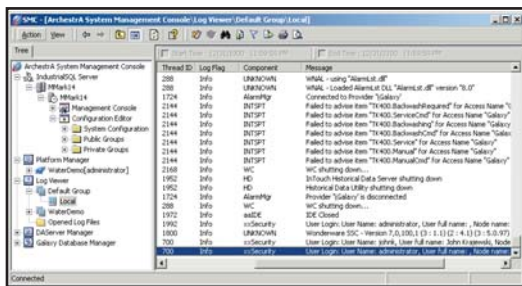
Remote System Maintenance

Remote Deployment

The Application Server also significantly lowers deployment costs associated with commissioning, upgrades and expansion. From the Industrial Application Server's IDE, users can easily deploy and manage their automation applications over large distributed networks, making the chore of installing and maintaining the application on every PC in the system a thing of the past.

Remote System-Wide Diagnostics

The Industrial Application Server allows engineers to save valuable engineering and troubleshooting time by centrally managing system-wide diagnostics. Any workstation on the network, local or remote, can be equipped configured to view the entire status of the system. System diagnostics include status related to all workstations and servers that make up the Industrial Application Server, including system communications, historian functions, supervisory application functions and even network health. These diagnostics plug into Microsoft Management Console; so all personnel can utilize a common, familiar Windows administration toolset.

APPLICATIONS

Distributed HMI

For distributed HMI systems, the Industrial Application Server provides manufacturers, OEMs and SIs with the flexibility and power of a distributed peer-to-peer architecture. The IAS gives users the freedom to re-architect and grow their distributed HMI applications, easily accommodating the need for new lines or retrofits, and at greatly reduced engineer costs. The component architecture also facilitates the powerful re-use of applications engineering from plant to plant. The Industrial Application Server is perfect for distributed HMI applications in which users have to manage expansion, frequent system changes, maintenance and replicated automation lines within or across plants.

SCADA

The Industrial Application Server is ideal for SCADA applications. Its distributed peer-to-peer, re-usable component architecture and remote deployment and maintenance capabilities make supporting SCADA applications more efficient than ever. The IAS component structure enables easy replication of SCADA object templates, lowering future development costs. In addition, remote deployment and maintenance make the Industrial Application Server ideal for projects that might have been negatively impacted by engineers who must travel or work off-site. Large oil and gas and water distribution systems are also easy to manage with the

Industrial Application Server's impressive scalability. Lastly, IAS leverages Wonderware's and its partner's communications severs, providing connectivity for a wide variety of PLCs, DCS, RTUs and other plant equipment.

Manufacturing Information Systems

As a result of the Industrial Application Server, manufacturing information management systems can be administered more efficiently and with less engineering effort. The Industrial Application Server can also serve as a powerful event engine, to manage large and/or complex manufacturing information management processes. Changing or expanding manufacturing information is easy with the Industrial Application Server. When the IAS is combined with Wonderware's advanced analytical and reporting clients and the Suite Voyager industrial portal, companies can efficiently deliver personalized plant information anywhere in the organization, from any source.

INTEGRATION WITH OTHER WONDERWARE FACTORYSUITE PRODUCTS

As a FactorySuite A^2 component, the Industrial Application Server is tightly integrated with the entire line of FactorySuite software tools, including:

- InTouch visualization software
- IndustrialSQL Server real-time plant historian
- ActiveFactory™ reporting and trend tools
- DT Analyst™ downtime analysis software
- QI Analyst™ SPC analysis software
- Device Integration via I/O Servers, DA Servers or OPC
- SuiteVoyager industrial intelligence portal
- InBatch flexible batch management
- InTrack™ resource and work-in-process (WIP) tracking

SYSTEM REQUIREMENTS

To run Industrial Application Server Release 1.5, we recommend the following minimum hardware and software configurations:

- FactorySuite A^2 Development seat–IDE with no Galaxy Repository (Project Database)
  - Windows Server 2003 or
  - Windows 2000 Professional with Service Pack 3 or
  - Windows 2000 Server with Service Pack 3 or
  - Windows 2000 Advanced Server with Service Pack 3 or
  - Windows XP Professional with Service Pack 1
  - Any IBM-compatible PC with
    - 2 GHz (or higher) processor clock speed
    - 256 MB Physical RAM (512 MB preferred)
    - 8 GB Free Hard Disk Space
- FactorySuite A" Development seat–IDE with Galaxy Repository (Project Database)
  - Windows Server 2003 or
  - Windows 2000 Server with Service Pack 3 or
  - Windows 2000 Advanced Server with Service Pack 3
  - Microsoft SQL Server 2000 with Service Pack 3 and
  - Any IBM-compatible PC with
    - 2 GHz (or higher) processor clock speed
    - 1 GB of Physical RAM or higher
    - 18 GB Free Hard Disk Space
- Industrial Application Server Runtime
  - Windows Server 2003 or
  - Windows 2000 Professional with Service Pack 3 or
  - Windows 2000 Server with Service Pack 3 or
  - Windows 2000 Advanced Server with Service Pack 3 or
  - Windows XP Professional with Service Pack 1
  - Any IBM-compatible PC with
    - 2 GHz (or higher) processor clock speed
    - 1 GB of Physical RAM or higher
    - 18 GB Free Hard Disk Space

[1] See deployment guide for specific recommendations.
[2] See deployment guide for specific recommendations.