GENESIS64
Product Brief

The largest cost of any automation project is in engineering the application. For an average project, this can be well over 60% of the total expenditure. Taking advantage of 64-bit computing can greatly reduce this effort, resulting in enormous savings and helping your bottom line.

The GENESIS64™ software suite from ICONICS, certified for Microsoft Windows® Vista™, Windows Server 2008 and the latest Microsoft operating system, Windows 7, takes advantage of true 64-bit technology from AMD and Intel, allowing for faster development of your automation solution.

GENESIS64 takes visualization and SCADA to new levels. To stay competitive in manufacturing, automation and IT technology environments changing at an ever-accelerating rate, companies need to adopt 64-bit technology. GENESIS64 is truly “64-bit-to-the-Core™.”

As a people-ready solution, GENESIS64 is “The Next Generation for Automation™.” Collaboration has never been easier, as GENESIS64 allows plant level workers and IT professionals to integrate real-time manufacturing and business information into a common, OPC-UA-compliant, Web-enabled visualization dashboard.

GENESIS64 takes advantage of the following Microsoft technology features, providing fast returns from your automation project:

<table>
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<tr>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>New Windows 7 Multi-touch</td>
<td>Interact with content in a simple and intuitive way</td>
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<tr>
<td>New Microsoft Silverlight</td>
<td>Development platform for creating interactive user experiences for Web, desktop, and mobile applications</td>
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<td>New OPC-UA Redundancy</td>
<td>High Availability Redundancy for the best communication reliability</td>
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<td>Microsoft .NET Framework</td>
<td>Web services to enhance the computing experience with highly integrated communications and information</td>
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<td>Windows Presentation Foundation (WPF)</td>
<td>Real-time visualization in 2D or 3D, taking full advantage of Windows Vista’s Aero interface</td>
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<td>Windows Communication Foundation (WCF)</td>
<td>Secure, reliable and transactional messaging and interoperability</td>
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<td>Windows Workflow Foundation (WF)</td>
<td>Scalable, transactional engine</td>
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<td>SQL Server</td>
<td>Comprehensive data management platform</td>
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<td>Search &amp; Organize technology</td>
<td>Ability to organize files to find information quickly</td>
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<tr>
<td>Gadgets, Sidebar and Sideshow</td>
<td>At-a-glance info, useful search abilities, valuable KPIs</td>
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<td>User Account Control (UAC)</td>
<td>Reduced exposure and attack surface of client and server applications, improving overall system security</td>
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<td>Microsoft Office 2007 and 2010 System</td>
<td>Ribbon and gallery technologies for user-friendly interface and easy-to-access operations for rapid development</td>
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<tr>
<td>Virtual Earth Geographical Information System (GIS)</td>
<td>Real-time visualization of widely dispersed assets</td>
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<td>Hardware-accelerated Graphics</td>
<td>3D imaging capability</td>
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Before 64-bit applications could become effective, there needed to be an operating system robust enough to handle customer expectations of the associated memory and speed boosts. Customers expected faster, feature-packed applications with captivating graphics.

ICONICS GENESIS64™ Web-enabled OPC HMI/SCADA suite is the result of ICONICS working early on during Microsoft’s development of the new Windows Vista and Windows Server 2008 operating systems to integrate the operating systems’ breakthrough features into a 64-bit HMI/SCADA and business visualization solution, culminating in its “Certified for Windows Vista” and “Certified for Windows Server 2008” designations.

64-bit technology has caught on with a number of hardware and software manufacturers. When 32-bit systems emerged, 4 gigabytes of memory may have seemed more than enough for typical PC-based applications. Soon, however, the cost of memory fell, making higher bit processing possible. 64-bit processors, including those from AMD and Intel, are found in the latest products from all major suppliers. The 64-bit architecture increases the memory capacity to $2^{64}$ addresses, equivalent to 16 exabytes (over 17 billion gigabytes) of RAM.

Currently, most software, including a great deal of what appears in industrial automation, is built as 32-bit code, not 64-bit code. Applications that take advantage of the memory and speed increase, as well as the improved multi-tasking, stress testing and clustering capabilities of 64-bit technology, will be perceived as vast improvements over any 32-bit counterparts.
The GENESIS64 suite includes several solutions that allow for connectivity from the plant floor to corporate business systems. It was designed from the ground up to take maximum advantage of Windows Server 2008, Windows Vista, .NET and SharePoint® technology.

According to Microsoft, “Windows Server 2008 builds on the success and strengths of its Windows Server predecessors while delivering valuable new functionality and powerful improvements to the base operating system. New Web tools, virtualization technologies, security enhancements, and management utilities help save time, reduce costs, and provide a solid foundation for your information technology (IT) infrastructure.”

“Windows Vista,” Microsoft states, “increases productivity and drives business success by improving security and compliance, optimizing desktop infrastructure, finding and making better use of information and enabling the mobile workforce”.

ICONICS software solutions such as GENESIS64 work in unison with these and other Microsoft technologies to provide further industrial automation benefits.

GENESIS64 is comprised of the following components and technologies:
- GraphWorX64™
- AlarmWorX64™
- TrendWorX64™
- EarthWorX™
- Hyper-Historian™
- Workbench
- OPC-UA Connectivity

ICONICS is a Microsoft Gold Certified Independent Software Vendor (ISV) Partner and has earned the “Certified for Windows Vista”, “Certified for Windows Server 2008” and “Compatible with Windows 7” designations. ICONICS is one of the first five companies worldwide (and the first within the industrial automation industry) to receive “Certified for Windows Server 2008” status, and is also one of the first companies worldwide to earn both certifications.
GraphWorX™64

GraphWorX™64 takes maximum advantage of Windows Presentation Foundation (WPF) technology for rich HMI and SCADA data visualization. It allows users to build scalable, vector-based graphics that do not lose details when zoomed upon. GENESIS64 also takes advantage of the Windows look and feel, including Ribbons found throughout Vista and other integrated applications, such as Microsoft Office 2007. Users can quickly browse through galleries that provide a rich preview of available actions. For instance, an operator may wish to add transparency and/or shading to several objects and, with GENESIS64, this task is done with just a few simple clicks, truly unleashing the power of 64-bit computing.

Unsurpassed Visualization Using Windows Presentation Foundation (WPF)

Windows Presentation Foundation (WPF) and XAML are at the core of GraphWorX64 and are widely used to provide real-time visualization of any manufacturing and business intelligence information. GENESIS64 exploits both the 2D and extensive 3D capability of WPF to deliver real-time data in a variety of visualization options, giving users the richest client user experience found today. GENESIS64 also takes advantage of state-of-the-art graphic hardware acceleration through DirectX10, powered by Windows operating systems. GraphWorX64, integrated with the Windows Presentation Foundation, provides users with a compelling 3D view of their operations in real-time with live data. Imagine the ability to view how equipment is running, in real-time, from any angle. It's a whole new approach to visualization.

COLLADA is the open standard for describing plant components as objects in different levels of detail and is key to allowing users to develop rich 3D models within GENESIS64 v10.5.

Collision Detection Technology does just as the names states; it checks for the collision of two objects allowing the objects to move on the screen in a virtual setting. With built-in collision detection in GENESIS64, conflicts between individual objects are immediately identifiable. The 360° degree simulation of a production plant is now possible.
**Silverlight Support:**
With integrated Microsoft Silverlight technology, GENESIS64 offers the highest flexibility for Web visualization, including:

- Light-weight plug-in with very small footprint
- Cross-Browser/Cross-Platform/Cross-Device
- Run in Internet Explorer/FireFox/Safari
- Run on Windows/Mac
- Run on Windows CE / Mobile devices
- Secure Web deployment
- Increase load speed and switch performance
- Publishing wizard allows for creation of Silverlight-enabled graphics

**Multitouch**
With Multitouch support built into GENESIS64, operators can control what happens on a touchscreen by using their fingers. For example, users can rotate an image on the screen by moving one finger around another, or can right-click by holding one finger on the target and tapping the screen with a second finger.

**Rich Symbol Library**
GraphWorX64 empowers users to take graphics to a whole new dimension – 3D. The 3D Symbol Library will save time and money, providing the ability to create captivating 3D graphics. Users have the power to quickly and efficiently add 3D symbols and animations to graphics and bring them to life.

3D symbols have been created for a wide variety of markets. Users are sure to find relevant tools and materials within their industry. Each 3D Symbol Library module available is broken down by categories, making it easy to quickly find what is needed, increasing productivity.

The 3D Symbol Library can be applied within the following industries:

- Automotive
- Oil/Gas/Petrochemical
- Pharmaceuticals and Biotechnology
- Building Controls
- Food and Beverage
- Water and Wastewater
- Government and Postal Systems
- Robotics
- Security Access
- Utilities/Power/Energy
- Machine Builders and OEMs
AlarmWorX64™

AlarmWorX64™ is a distributed enterprise-wide alarm and events management system. Available in the standard GENESIS64 suite of applications, or as a stand-alone Open Series component, AlarmWorX64 offers the tools you need to deliver real-time and historical alarm information throughout your system.

AlarmWorX64 contains a new 64-bit native server and logger and interoperates with OPC-DA and OPC-UA Servers, as well as fully supports both 32- and 64-bit OPC servers, making it the most open alarm management solution in the market.

Benefits include:
- **Ease of Use/Consistent Look and Feel** – from AlarmWorX64’s task-centric user interface with Ribbons
- **Rapid Development Capability** – utilizing Galleries for one-click styling
- **Quick Deployment/Easy Maintenance** – via a centralized work environment
- **Compliance with Common Standards/Robust and Secure Communications Platform** – due to OPC-UA Connectivity

**AlarmWorX64 Configurator**

Based on the next generation for toolkits and part of the new GENESIS64 Unified Workbench, the new AlarmWorX64 Configurator supports remote operations and is truly a thin-based client, allowing it to run inside Microsoft Internet Explorer. The Configurator supports online configuration changes and implements Optimistic Concurrency when used in a multi-user enterprise environment. Alarm configuration has never been this easy.

The AlarmWorX64 Configurator provides:
- Remote Configuration
- Unified Look and Feel
- Definable Alarm Conditions
- Alarm Association with Areas
- Same Concepts as in AlarmWorX32

**AlarmWorX64 Viewer**

View both real-time and historical alarms in the same OPC-UA-enabled Windows Presentation Foundation viewer. View from multiple data sources while adding new visualization features such as color translucent gradients for identifying key alarm conditions and improving operation response.
Additional new features include more formatting power for individual alarms, server-side OPC-UA filtering of alarms, client-side filtering in charts and grids, multi-level grouping and sorting capabilities, the ability to use images and hyperlinks in grid cells and the translation of raw server data.

The AlarmWorX64 Viewer provides:
- One Unified WPF Control
- OPC-UA Technology
- Visual Effects (including color gradients and translucency)
- Multiple Data Sources
- Multiple Views of the Same Data Source

**Alarm Charting and Reporting**
Alarms logged to a database can be a chore to sort through and analyze. Powerful Historical Alarm Analysis/Reporting solves this problem by easily creating filtered reports, pie charts, bar plots and more. At the click of a button, you can find out which alarm is occurring most often and see if there are certain “trouble-spots,” as well as review downtime and more.

AlarmWorX64 allows reporting (user-configured or preconfigured) and graphing of alarms. The source of the alarm data can be live alarms, alarms previously logged by the Alarm Logger or a combination of both. The Alarm Report can be dropped within any GraphWorX64 HMI Display or directly in the Workbench.

AlarmWorX64 features a Windows inspired, updated GUI with expression-based columns and an improved Animate/Deanimate function.
**TrendWorX64™**

TrendWorX64™ is an enterprise-wide data collection, logging, charting, reporting and analysis solution. Available in the standard GENESIS64 suite of applications, or as a stand-alone Open Series component, TrendWorX64 offers the tools you need to trend and chart real-time and historical data from all your enterprise assets.

TrendWorX64 is OPC-UA-to-the-Core™ and provides open connectivity to any OPC/OPC-UA data source, making it the most state-of-the-art OPC trending application. This means it can easily plug and play with not only ICONICS servers and trend components, but with other 3rd-Party trending solutions, as well.

**Benefits include:**

- **Ability to Use Vector-based Instead of Raster-based Graphics** – due to interaction with Windows Presentation Foundation technology, which also helps to make trend graphics screen-size-independent and provides smooth animations
- **High Performance and 3D Charts** – possible through graphics hardware acceleration
- **More Efficient Data Management** – via 64-bit-based solution
- **Allows for Concurrent Changes Via the Web** – with interactivity between remote online configuration sessions
- **Easy to Use/Consistent Look and Feel** – due to the task-centric user interface based onRibbons
- **Rapid Customization of Trends, Pens and Plots** – via Galleries and one-click styling
- **Logging and TrendWorX Configuration in the Same Location** – with a centralized work environment
- **Multiple Data Source Availability/Historical and Real-Time Data Simultaneously Accessible** – as data is collected through OPC-UA technology
TrendWorX64 Configurator
Using the new GENESIS64 Unified Workbench to configure trends and charts is fast and easy with the TrendWorX64 Configurator tabbed menu and enhanced Tree view. Integration with Windows Communication Foundation (WCF) allows users to build the most secure, reliable, transacted and interoperable distributed trending applications.

TrendWorX64 Viewer
Trend and chart data in the standard Time Based Chart or quickly choose any of the following from the styling gallery: X vs. Y, Logarithmic, Bar Graph, the popular Strip Chart Recorder, Circular Charts and more.

Plotting both real-time and historical data in the same trend plot allows you to compare last week’s data, for instance, to current information. Trend production numbers against a target. Plot batch data against a known recipe curve and more.

Use the intuitive ribbons and galleries to customize your trend or chart by adding color, gradients, smooth animation, translucency, glass effect, anti aliasing and more. Drag and drop data sources during runtime, view multiple trends simultaneously, or create as well as different plot types on the same trend.
**TrendWorX64 Server**
The new TrendWorX64 Server is truly 64-Bit-to-the-Core™ allowing for greater efficiency and scalability, optimized memory usage and higher availability of process points. The server is compatible with ICONICS GENESIS32™ and can be easily accessed through GENESIS64’s Workbench utility.

**Universal Connecting**
- OPC-DA
- OPC-UA
- GENESIS64 Hyper Historian
- TrendWorX32 Server
- TrendWorX64 Server
- OPC-UA HDA
- OPC HDA
- SNMP
- 3rd Party Databases/Plant Historians
EarthWorX™

EarthWorX™, GENESIS64's new geographical information technology, provides real-time visualization to widely dispersed assets such as factories, facilities, oil fields and many others. ICONICS' unique SmartPin™ technology allows for an innovative drill-down capability to quickly view alarm conditions and status for any location around the world. Within seconds, that asset can be identified and located through GENESIS64's integration with Microsoft's Bing maps.

Benefits include:

- Ability to Correlate Information Geographically
- Immediate Geographical Analysis
- Easy Contextualization of Data – via state-of-the-art GIS capabilities
- Integration with GraphWorX64, Workbench, BizViz (as a Web part) or as a Windows Vista Gadget

Object types within EarthWorX come in a variety of configurations, including:

**PushPins**

PushPins can convey a basic-level element on a map and can use a variety of custom images, appropriate to the industry or application.

**TextPins**

TextPins make relevant information constantly available. They are highly customizable due to the text-based information that can be displayed.

**SmartPins**

SmartPins are completely customizable and come in a variety of shapes. They are used to quickly visualize the performance of an asset by the color of the pin. Green can indicate all systems are OK, yellow a potential problem and red an alarm condition or immediate action is needed. SmartPins are a valuable tool when needing to quickly identify a large number of geographically dispersed assets.

SmartPins can be made into any shape, convey any signal and contain any number of Smart Icon “squares”. Their color-based interpretive ability makes it possible to immediately understand and analyze huge amounts of data. SmartPins add context to maps to understand potential problems due to geographical aspects (for instance, weather or available power supplies).
Pick Action Types
EarthWorX object types are able to perform a number of actions, including:
- Launch a GraphWorX64 Display
- Launch Internet Explorer/Links
- View a Tool Tip
- Read/Write Operation to Any Data Source
- Launch Other GENESIS64 Operations
- Launch Other Windows Applications
- Acknowledge Alarms

EarthWorX Configuration
Configuring EarthWorX is quick and easy with the new GENESIS64 Unified Workbench. The configuration pad can be sorted and has drag and drop capabilities and collapsible panels. From the intuitive configuration pad, users can add, remove and edit objects as well as bookmark views. Data can be exported and imported for easy configuration.

Track Movable Assets
Are your assets constantly moving? Track movable assets during transportation via GPS coordinates. Assign custom icons and configure them with fully customizable pop-up information boxes.
Workbench

The Workbench is the centralized Web-based environment for all GENESIS64 components' configuration. It can also act as an advanced operator interface for service management and has built-in project management functionality.

Web-Based Configuration Environment

All GENESIS64 configurations can happen from the unified Workbench, allowing for faster development and cost savings in building any application.

- Remote Web-Based Configuration
- Ability for Concurrent Configurations
- Fully Customizable User Interface
- Customizable Ribbons (including runtime)
- Supports Online Changes
- Outlook-style Navigation Bar
- Card Flow and Carousel Navigation
- Load-On-Demand Support
- Supports All GENESIS64 Servers
- Layout Manager
- Full SNMP support
- Pack & Go for Easy Product Deployment

Operator Interface

Service management is reliable and easy with the GENESIS64 Workbench. From the Workbench users can:

- Remotely Start and Stop Any GENESIS64 Service
- Monitor Service Health
- Get Statistics for Any Service

Project Management

The Workbench allows you to have complete project management capability for your application. The GENESIS64 Workbench contains the following project management functionality:

- Project Deployment, with Pack and Go Support
- Versioning and Change Management
- Global Find and Replace
- Project Statistics
- Monitor Start and Stop Services
- Screen Manager
- Security Configuration and Login
OPC-UA Connectivity

OPC Unified Architecture (OPC-UA) is a robust, secure and scalable expansion of the highly successful basic COM/DCOM-based OPC standard communication protocol. OPC-UA allows the interoperability of best-of-breed real-time, alarm management and historian systems. This allows for a standard model of plant floor integration with the enterprise. Any plant system that is currently using OPC communications can easily add OPC-UA applications to their existing system, giving them the added value of Web services that allow for more enterprise connectivity.

ICONICS’ new GENESIS64 is truly “OPC-To-The-Core™,” exemplifying the next generation of OPC Data Access, OPC Alarm and Events and OPC Historical Data Access. The built-in technology allows for secure, open connectivity from plants and facilities to the enterprise level.
GENESIS64 Redundancy
For mission critical projects, where applications need to run around the clock and be fail-safe, GENESIS64 offers high availability redundancy for the best communication reliability.

With high performance automatic failure detection, GENESIS64 users can be assured that mission critical data, alarm and historical information is always available for viewing and logging whenever it is needed.

Alarm notifications, based on server failure, ensure that operations are automatically informed when failures are detected.

A store-and-forward feature in the alarm logger (ensures) that data access, alarms and historical information are not lost in the event of a server failure.

ICONICS redundancy solutions are simple to configure, install and deploy. Software redundancy covers all major aspects of data redundancy such as data access, alarms, historical data and security. In GENESIS64, OPC software redundancy provides full automatic switchover for OPC data access (DA), Alarms & Events (A&E), Historical Data Access (HDA) and Security.
Operating Systems Supported
GENESIS64 presently supports the following systems:
  Microsoft Windows 7 64-bit
  Microsoft Windows Server 2008 64-bit
  Microsoft Windows Vista 64-bit
  Microsoft Windows Server 2003 64-bit
  Microsoft Windows XP 64-bit

System Requirements
GENESIS64 requires the following hardware and software components. System requirements may vary based on application size, system performance requirements, and loading factors.

Minimum Hardware and Operating System Requirements:

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<th>Component</th>
<th>Requirement</th>
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| CPU              | 2.4 GHz Single Core 64-bit processor (AMD Athlon 64, AMD Opteron, Intel Pentium 4 EM64T)  
|                  | 1.6 GHz Dual/Multi Core 64-bit processor (AMD Athlon 64 X2, Intel Pentium D, Intel Core 2 Duo, Intel Xeon) |
| Memory¹          | 2 GB of memory required  (6 GB recommended)                                  |
| Hard disk        | At least 1 GB of free hard disk space required                               |
| Drive            | 8X speed CD-ROM/DVD-ROM                                                      |
| Display          | Recommended: Onboard Video Memory (256 Mегs)  
|                  | Display Resolution Minimum: 1024x768, 16bit color  
|                  | Recommended: 1280x1024 32bit color (or better), DirectX 9 or 10 Video Card or better |
| Operating System | Microsoft Windows 7 x64, Windows Vista SP2 x64, Windows Server 2003 x64, Windows Server 2008 R2 x64 |
| Web Server       | Microsoft Internet Information Services (IIS) 7.0                          |

Note 1: It is recommended that the system page file size be a minimum of four (4) times the size of installed (physical) RAM.
Note 2: The user also has the option of designating a remote SQL Server, in which case the user will not be forced to install SQL Server locally.
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WHY CHOOSE ICONICS?
ICONICS, Inc. is a leading provider of award-winning enterprise
manufacturing intelligence and automation software solutions
and implementation services. ICONICS solutions deliver real-
time visibility into all enterprise operations and systems, helping
companies to be more profitable, more agile and more efficient.
ICONICS products have delivered value within over 250,000 installations
worldwide and have been chosen by more than 70% of the Fortune 1000.