

GENESIS32 Condensed Training Manual

Version 7.0

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Introduction to GENESIS32

1

1.1 Introduction

GENESIS32 Enterprise Edition™ (GENESIS32™) is a family of OPC-based (OLE for Process Control) client and server applications for Human Machine Interface (HMI), Supervisory Control And Data Acquisition (SCADA), and Control. GENESIS32 is a completely Web-enabled product that uses the latest technologies like OPC (OLE for Process Control), Microsoft® ActiveX®, COM/DCOM (Component Object Model and Distributed Component Object Model) and VBA (Visual Basic® for Applications).

1.2 What Is OLE™ for Process Control?

OLE™ for Process Control (OPC™) is the common way for connecting data sources such as devices, databases, etc. with HMI client applications. It enhances the interface between client and server applications by providing a standard mechanism to communicate data from a data source to any client application. In other words, OPC is Plug and Play in the field of HMI and Automation.

The main difference between traditional client–server architecture and OPC based client–server architecture is shown in Figure 1.1.

In the traditional case, servers or devices have different interfaces/drivers for each client application. (Each arrow line represents a driver or interface software). This is because although the protocol of a device or a server may not change, the architecture of different client applications (from different vendors) is different. This leads to increased work, costs and time. If the device or server's protocol is changed or updated, then the client application also needs to change.

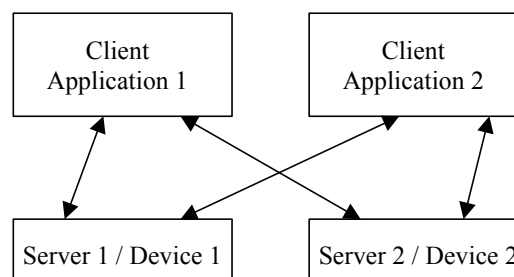


Figure 1.1 Old/Traditional Client–Server Architecture

OPC Architecture was introduced by the OPC Foundation mainly to overcome the above issue. In this case, a device/server will have only one standard driver which is

OPC-compliant (Server) and all the client packages can be connected to it as the clients themselves are OPC-compliant (Client).

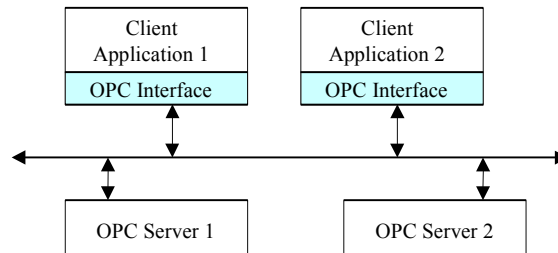


Figure 1.2 OPC-Based Client-Server Architecture

1.3 What Is GENESIS32 Enterprise Edition?

GENESIS32 Enterprise Edition is a family of 32-bit OPC Client and Server Applications from ICONICS for Windows 95, Windows 98, Windows ME, Windows NT, Windows 2000 and Windows XP. All these applications are multi-threaded and feature ActiveX and Visual Basic for Applications (VBA) technology.

ICONICS offers a set of stand-alone OPC Client Applications for Graphics, Data Collection/Trending, and Alarming, which are:

- GraphWorX™32
- TrendWorX™32
- AlarmWorX™32

Each client application is an ActiveX container featuring Internet/intranet-ready object technology and offering Microsoft's powerful Visual Basic® for Applications (VBA) technology. ICONICS' client applications communicate directly with an OPC server, which in turn communicates with the hardware devices in the field.

GENESIS32 Enterprise Edition™ is a suite of these software components that provides a complete solution for HMI/SCADA software applications. In addition to the above three main modules, the following applications are also included:

- ScriptWorX™32
- ProjectWorX™32
- Screen Manager
- DataSpy™
- GenBroker™
- Dr. DCOM
- Security Server
- Secure Desktop
- Tag Browser
- Security Server

ICONICS also offers a variety of other software modules to complement the GENESIS32 Enterprise Edition. The following are available as add-on options:

- WebHMI™
- DataWorX™32
- AlarmWorX™32 Multimedia
- ControlWorX™32
- MobileHMI™
- Symbols32 Library
- ActiveX ToolBox
- ICONICS OPC Servers
- Third-party OPC Servers
- OPC ToolWorX™
- ActiveX ToolWorX™

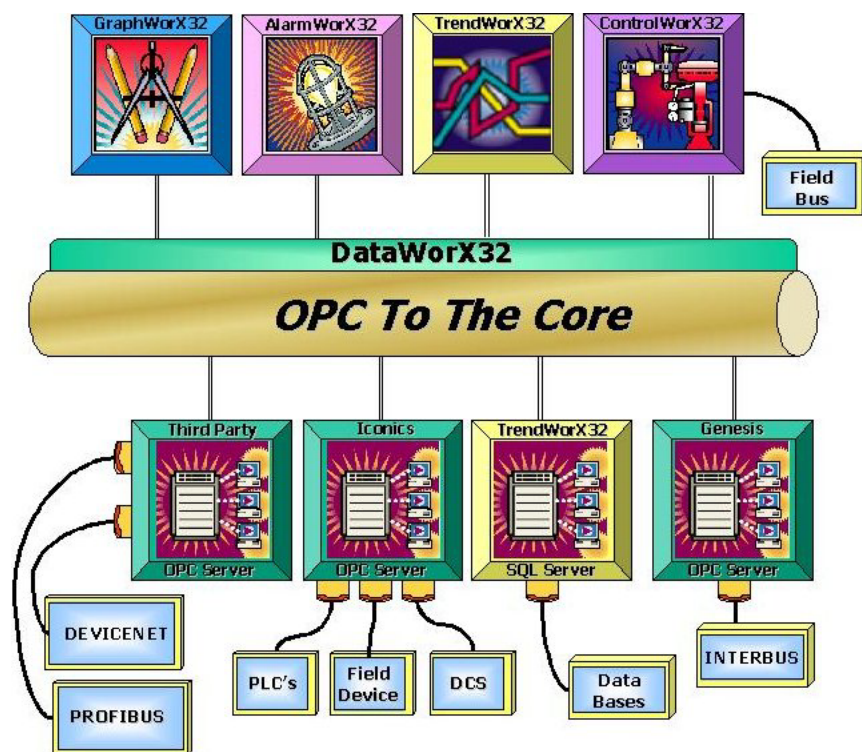


Figure 1.3 GENESIS32 Architecture

GENESIS32 Installation

2

2.1 Objectives

In this chapter we will see the minimum system requirements to run GENESIS32 and then install the GENESIS32 Enterprise Edition.

2.2 System Requirements

To use the GENESIS32 software, you must have the following minimum system requirements:

- 8X Speed CD-ROM.
- A minimum of 300 MB disk space available for installing the default GENESIS32 software. (Note: The actual amount of space required may decrease if help and example files are not installed. Project requirements for logging data, alarms and screen storage exceed this minimum.)
- VGA video card (256 or more colors for best results).
- Microsoft® Internet Explorer 5.5 or above.
- Microsoft® Data Access Components (MDAC) 2.7.
- Microsoft® Windows® 98 SE, Windows 2000 with Service Pack 3, Windows ME, Windows XP with Service Pack 1, or Windows NT® 4.0 with Service Pack 6a.

Note: Windows 98 SE is supported only by the non-Unicode version of GENESIS32.

Minimum computer CPU and RAM requirements depend on the application and operating system, as shown in **Table 2.1**:

Application Size	Processor	RAM
Small Windows 98 SE/ NT Workstation/ ME, 2000, XP	233 MHz 400 MHz	64 MB 128 MB
Medium Windows 98 SE/ NT Server/ ME, 2000, XP	400 MHz 650 MHz	128 MB 256 MB
Large All Operating Systems	1.8 GHz	512 MB - 1GB

Table 2.1 Minimum CPU and RAM requirements

The actual amount of RAM and/or processor speed will vary depending upon the I/O counts, networking, logging and alarming requirements, as well as other factors. To determine which type of computer best fits your application, set up a test application station.

Note: The processor and memory requirements of your existing project may be greater in this version of GENESIS32 than in previous versions due to additional and enhanced features in the product.

2.3 Instructions for Installation

The following procedure explains how to install GENESIS32 Enterprise Edition. Start your Microsoft Windows operating system. You need to login as a user with Administrator privilege for Windows NT/2000/XP before installing GENESIS32 Software. Insert the product CD into the CD-ROM drive. The CD may auto-start, in which case simply click on the GENESIS32 button. You can also install GENESIS32 by double clicking on the Setup.exe file on Disk1 of the product.



Figure 2.1

2.3.1. ADO Installation

1. The ICONICS Setup introductory screen displays briefly as shown in **Figure 2.2** while installation is initializing.

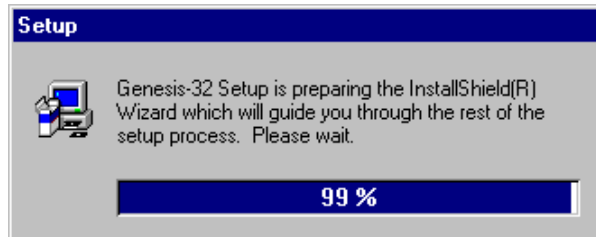


Figure 2.2

2. A message will indicate that **Microsoft Data Access Components (MDAC)** have to be installed before the installation of GENESIS32. ADO (Active Database Object) & OLEDB (Object Linking and Embedding for Databases) are the two major MDAC components that are required to be present on a system for successful running of GENESIS32. Click **OK**.

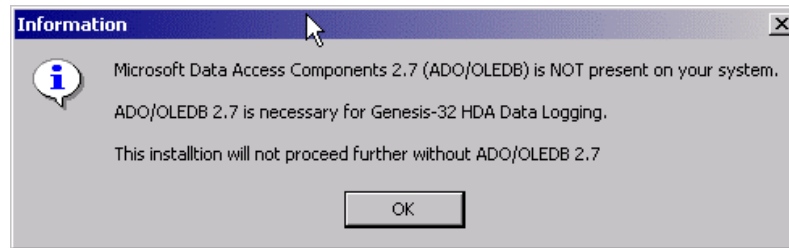


Figure 2.3

3. The window in **Figure 2.4** will appear, asking to reboot after installation of ADO components. Click on **Yes** to start installation of ADO/OleDB 2.7.

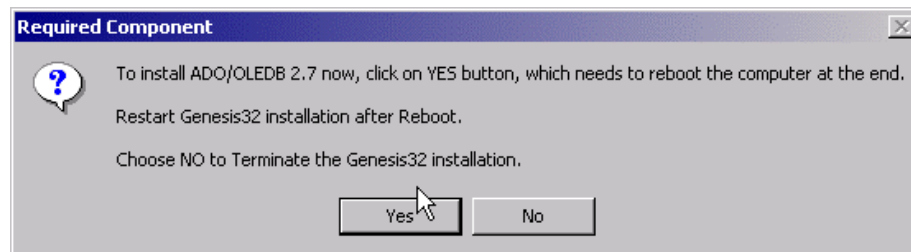


Figure 2.4

4. Extraction of all MDAC files proceeds as in **Figure 2.5**.



Figure 2.5

- The actual installation of MDAC itself will begin after the user clicks **Yes** on a Microsoft License Agreement. See **Figure 2.6**. Please read carefully and then if you agree, click on the check box that says, “I accept all of the terms of the preceding license agreement”.

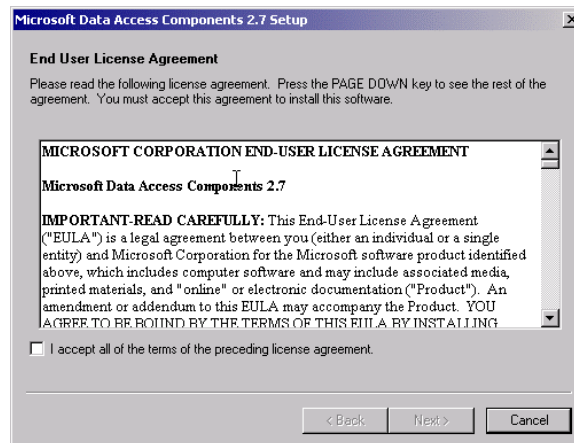


Figure 2.6

- 6. MDAC 2.7 setup dialog follows.**

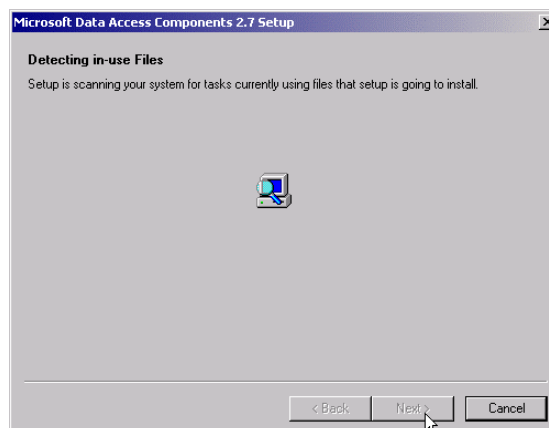


Figure 2.7

7. The two windows that follow (**Figure 2.8-2.9**) show installation and copying of files.

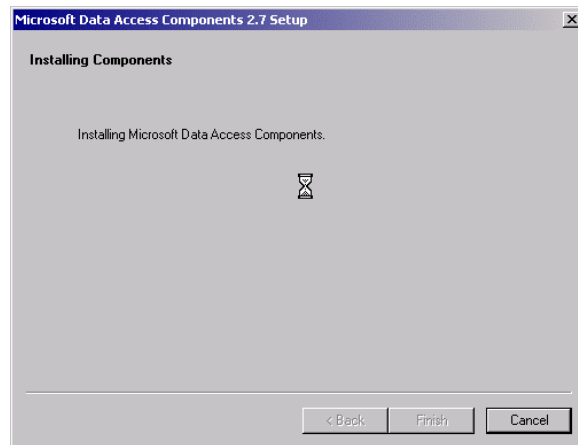


Figure 2.8

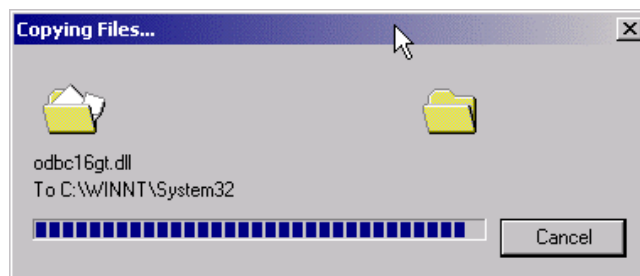


Figure 2.9

8. After the afore mentioned components have been installed automatically from the GENESIS32 CD, you will see the window in **Figure 2.10**, which informs of the completion of ADO installation. Click on the **Close** button to exit the MDAC installation.

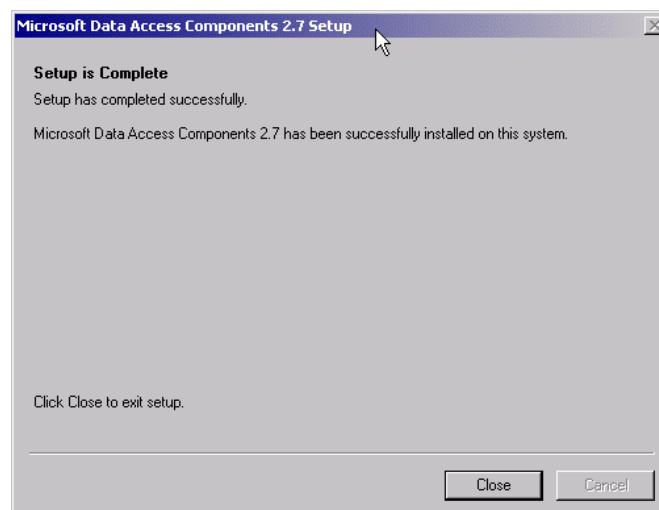


Figure 2.10

2.3.2. GENESIS32 Installation

1. After ADO installation, click on the **GENESIS32** button once again. This will prompt the installation of GENESIS32. The installation will smartly verify that the required ADO components have already been installed.



Figure 2.11

2. Installation of GENESIS32 will start with Figure 2.12.

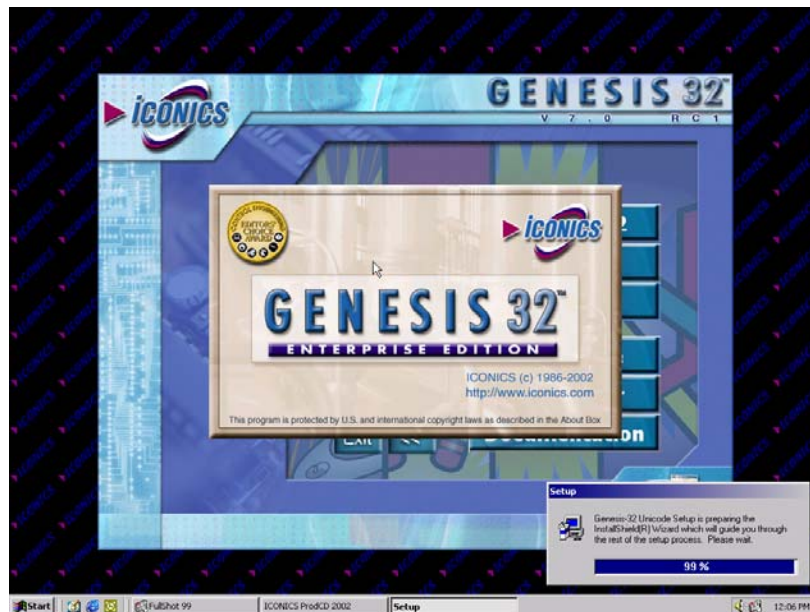


Figure 2.12

3. The WELCOME screen in **Figure 2.13** appears. Click on the **Next** button.

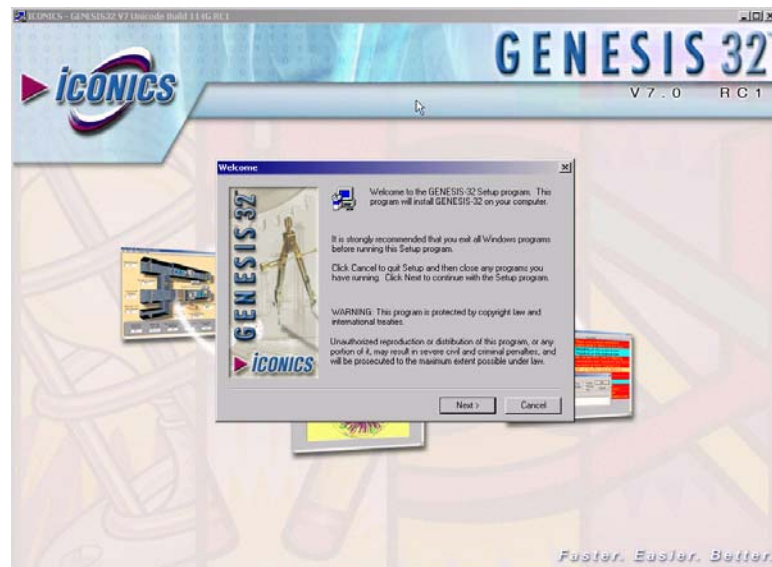


Figure 2.13

4. Please read the Software License Agreement and if you agree click on the **Yes** button to proceed.

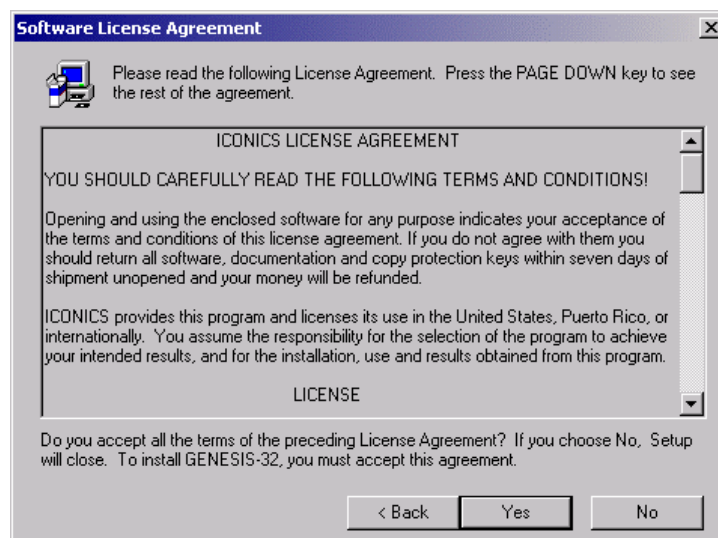


Figure 2.14

5. Please enter your **Name** and **Company Name** on the **User Information** window, shown in **Figure 2.15**. Click on **Next**.

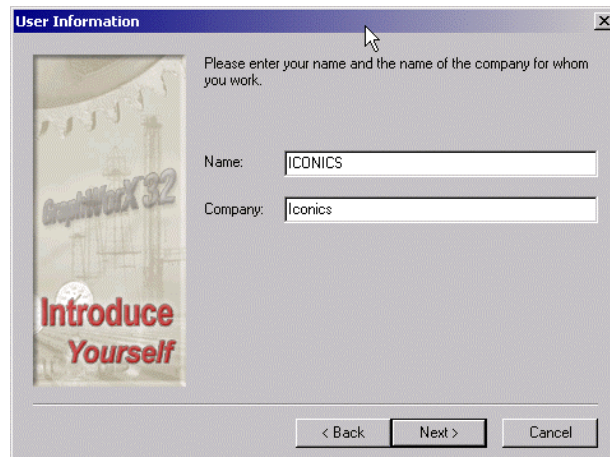


Figure 2.15

6. In the **Security Password** dialog, please enter a password that will later be used to configure the ICONICS Security. This will be used as an administration password. You can setup security options later by typing this password when logging in.

The default password is **ICONICS**, with no user name. It is very important that the user remembers or makes a note of whatever password is typed in here. The user, however, does have the ability to change the Security configuration password at a later stage. Click on **Next**.



Figure 2.16

7. Choose the **destination location** on your hard disk for the installation of GENESIS32. The default installation location is **C:\Program Files\ICONICS\GENESIS-32**. You may choose a different location by clicking on the **Browse** button.

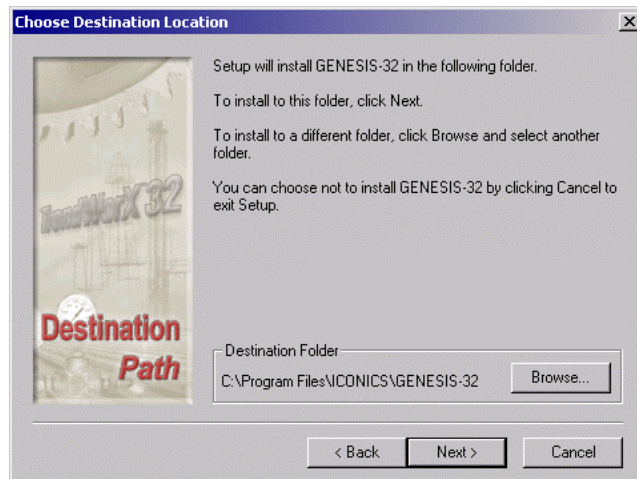


Figure 2.17

8. In the **Component** window shown in **Figure 2.18**, you may choose to selectively install GENESIS32 components. For the purpose of training, please check and install all components. Please verify available disk space before proceeding.

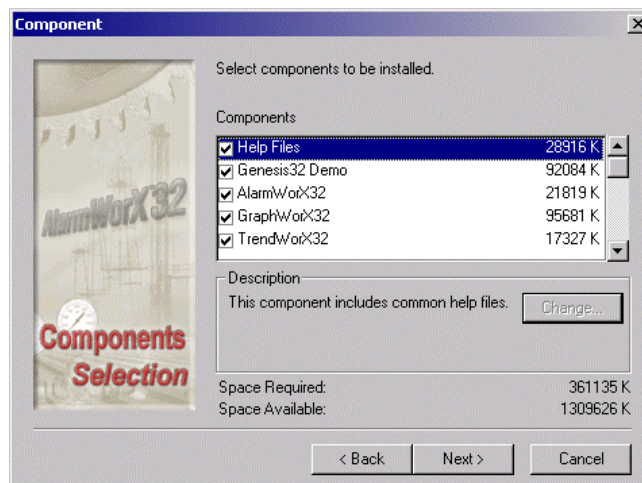


Figure 2.18

9. In the **Select Components** dialog, you may choose between the following two install types (a and b) or none (c), and click on **Next**:
- Browser Station** type installation will NOT allow for connection to local I/O(input/Output) OR a local license. This type will, however, give all the GENESIS32 development and runtime capabilities.
 - GraphWorX32 Runtime Only** type installation will allow only runtime capabilities for the GraphWorX32 module. You CANNOT develop graphic screens with this type of installation.

- c. Choosing **NONE** of the above will give you a complete installation of GENESIS32 with all development and runtime capabilities, with no restrictions.



Figure 2.19

10. On the **Select Program Folder** window (Figure 2.20), you can select a name by which an entry will be created in the Start Menu. The default is **ICONICS GENESIS-32**. Click on **Next**.

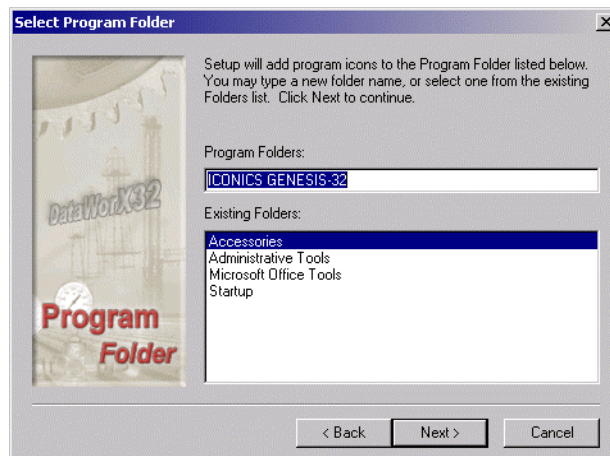


Figure 2.20

11. The installation now starts with initializing VBA and copying system files. A status bar indicates the extent of installation.
12. Set up will install several components like VBA, Crypkey service (for Licensing), etc. These installations will also show a status bar.

2.3.3. Unicode Font Installation

1. GENESIS32 Version 7.0 is a UNICODE installation (allows for language switching). This requires the installation of Arial Unicode font from Microsoft. Please read the agreement and then click on the **Yes** Button if you agree.

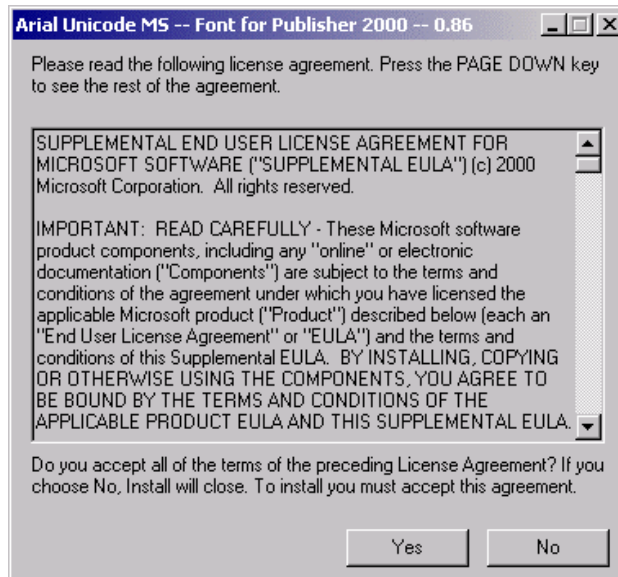


Figure 2.21

2. The installation of Arial Unicode font begins.



Figure 2.22

3. Click on **Ok** to complete the font installation.



Figure 2.23

4. The installation of GENESIS32 is now complete. It is required to reboot the machine, but prior to that, there is a prompt that asks for installation of **GENESIS32 Software Licensing**. Please click **Yes** to do so.

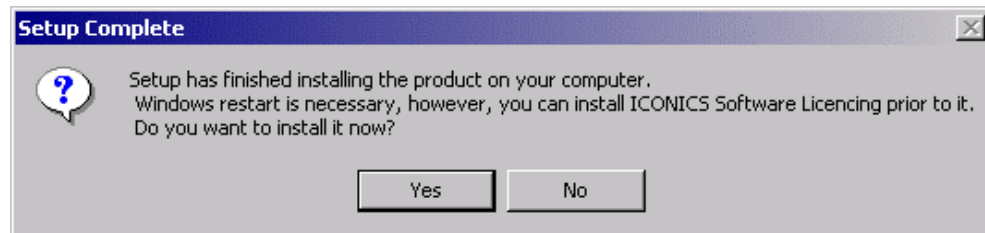


Figure 2.24

2.4 ICONICS Software Licensing Installation

GENESIS32 software products use a software-based licensing scheme. An activated license is required to use the software in full production mode. This license designates which products may be used, as well as the I/O point-count limit used in the system.

To install Licensing software:

1. Click on the **Licensing** button on the first install window. The ICONICS Software Licensing will begin the process as in **Figure 2.25**.

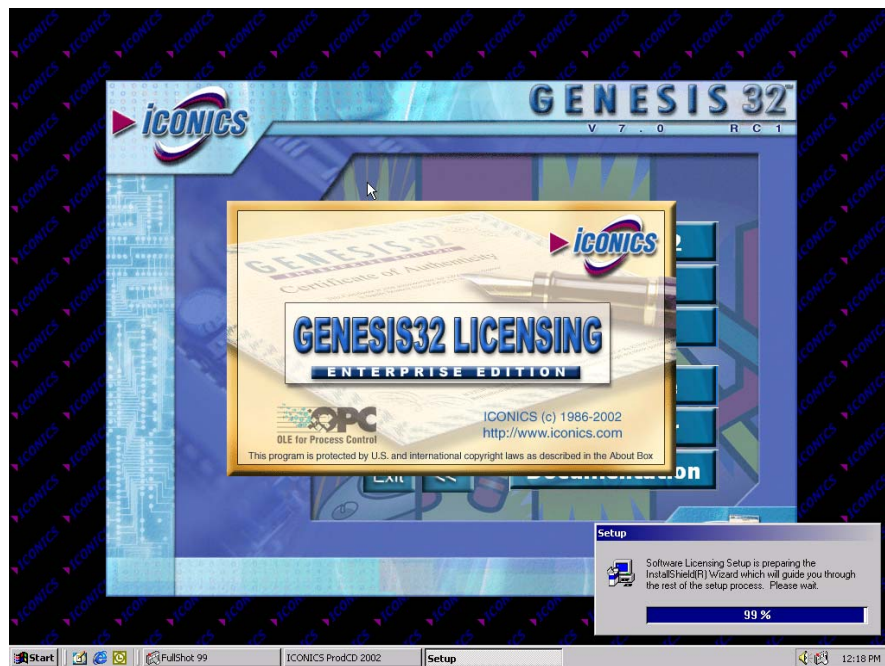


Figure 2.25

2. Click **Next** on the Welcome screen shown in Figure 2.26.

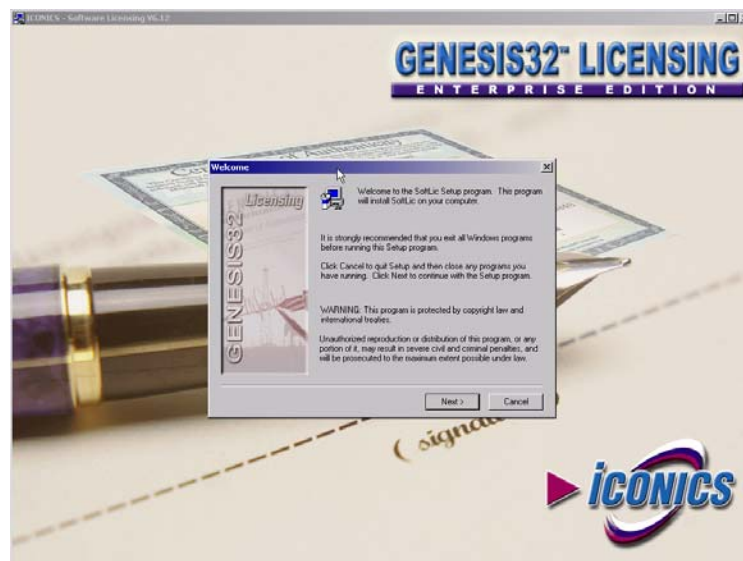


Figure 2.26

3. Please read the **Software Licensing Agreement** carefully, and click on **Yes** if you accept.

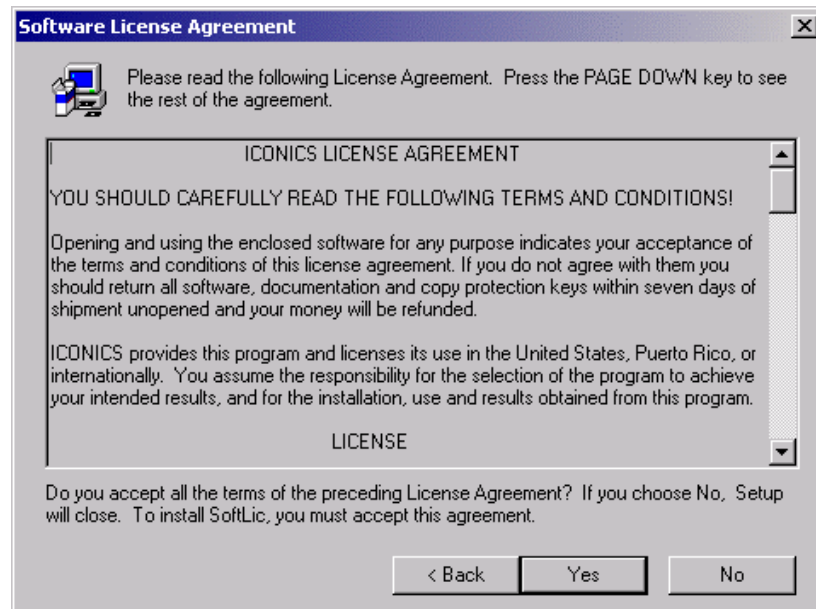


Figure 2.27

4. On the User Information dialog, it is required that you add your **Name** and **Company Name**. Click **Next**.

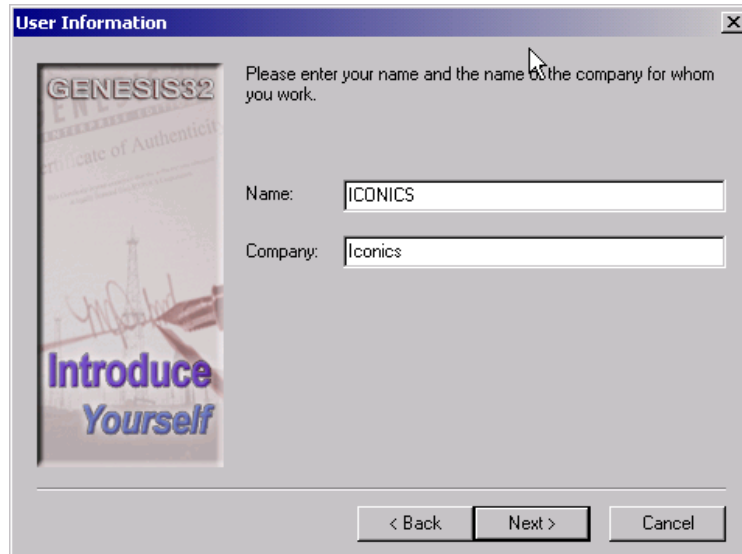


Figure 2.28

5. The default destination path for the ICONICS Licensing Software is **C:\Program Files\ICONICS\Softlic**. You may choose to change this location by clicking on the **Browse** button in the **Choose Destination Location** dialog in **Figure 2.29**. Click **Next**.

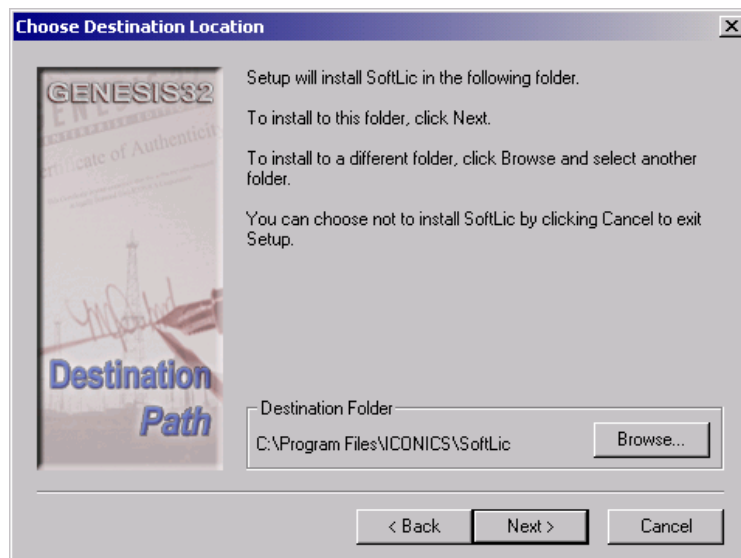


Figure 2.29

6. Like in the GENESIS32 installation, you can select to have a different name in the Start Menu for the Licensing Software. The Default is **ICONICS Software Licensing**. Click **Next**.

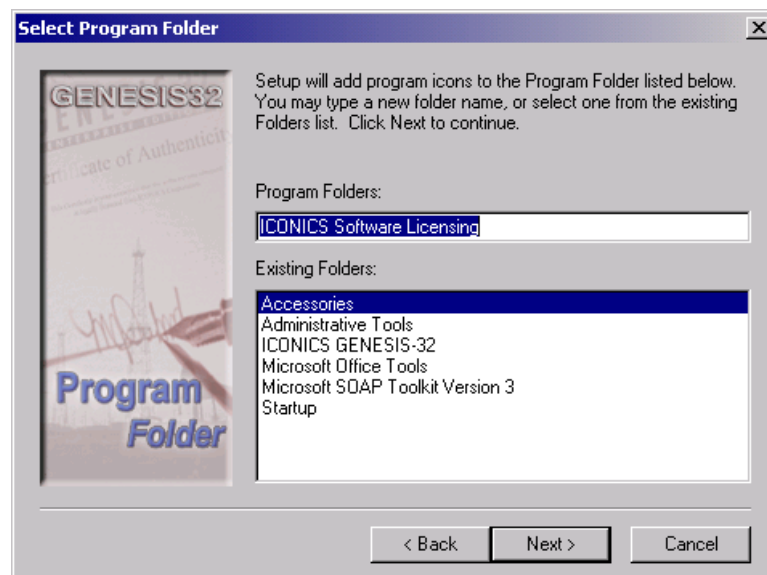


Figure 2.30

7. The next window, Important Notice has very important information on how the licensing works and how to activate a license on your machine. Please read it and click Next.

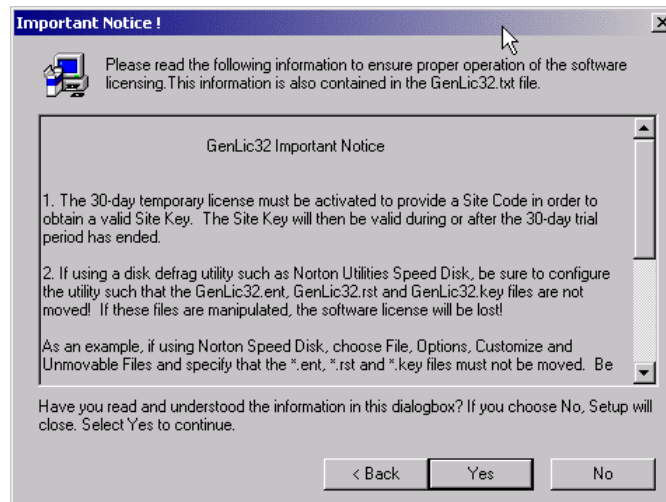


Figure 2.31

8. On the **Notice Acknowledgement** dialog, please confirm that you have read the important notice (if you have), by clicking on the check box that says, "Yes, I have read and understood the notice". Click **Next**.

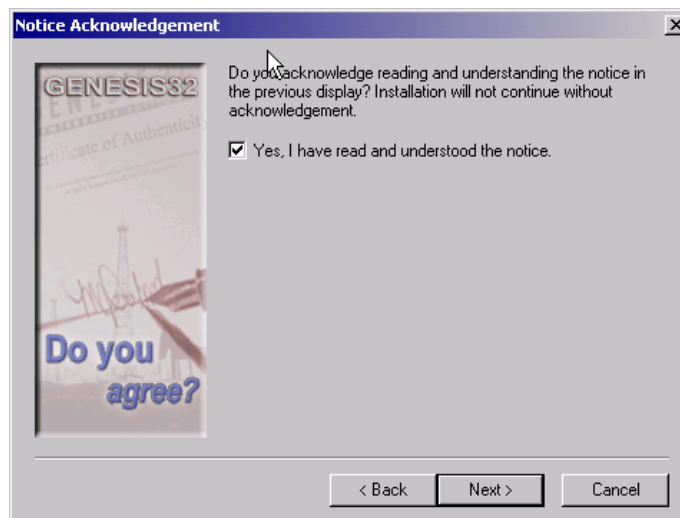


Figure 2.32

9. This will install **ICONICS Licensing Software** on your machine. See **Figure 2.33**.

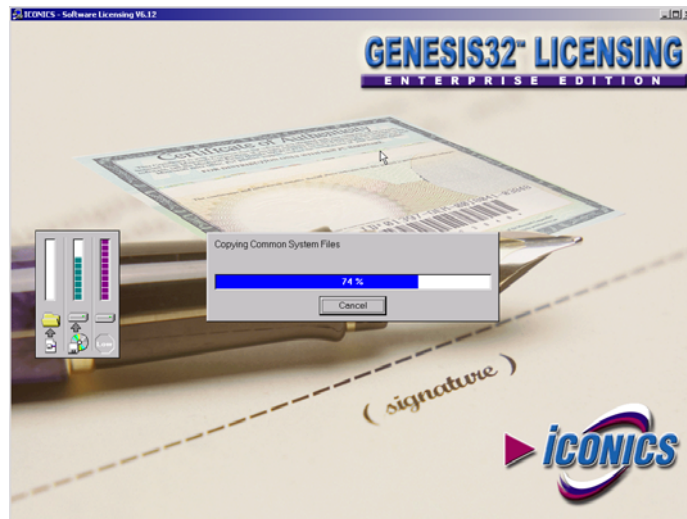


Figure 2.33

10. Set up has now finished installing the Licensing Software. If you would like to be taken to the ReadMe file (with information on the software), click on **Yes, I want to view the ReadMe file**. This file contains important information, such as new features, hints about enhancing system performance, technical support, and other contact information.

The ReadMe file also contains any last minute information that did not make it to the documentation. This file is also installed on your hard disk for later reference.

If you would like to launch the **License Utility**, click on **Yes, I want to launch GenLic32.exe now**. Click **Finish**.

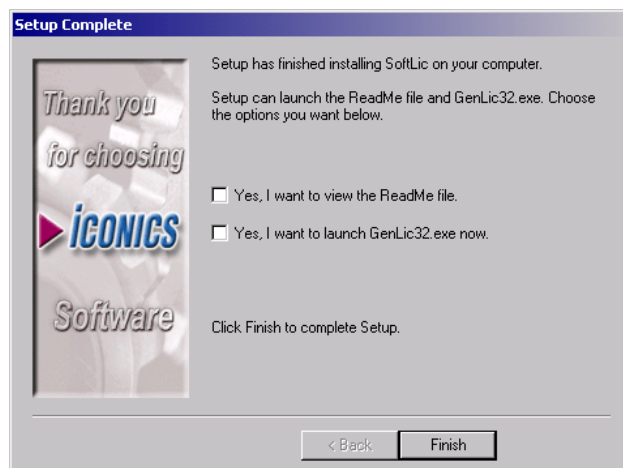


Figure 2.34

11. Installation of the GENESIS32 Licensing Software has now been completed. The window in **Figure 2.35** will appear, and your machine will then reboot. If it does not, please do a manual reboot, by going to **Start→Shut Down→Restart**.



Figure 2.35

2.5 Location and Contents of GENESIS32 Folder

1. The product is now installed on your machine. Open the **Windows Explorer** and expand **C:\Program Files\ ICONICS**. The folder primarily consists of two folders: **GENESIS-32** and **Softlic** (from our installations in the earlier part of this chapter).

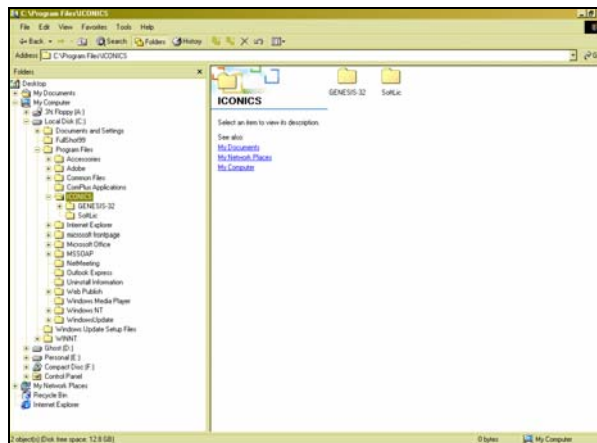


Figure 2.36

2. The **GENESIS-32\Bin** folder is the main folder where all application files are located. The **Examples** folder is a collection of a comprehensive list of examples using all ICONICS applications. The **GenlicWin9X** folder has license files for Windows 95 and 98. **Project1** folder is where a user can save configuration files, and is used by ProjectWorX32. **PWXTemplates** is a collection of popular ProjectWorX32 templates. The **Symbols** folder is a collection of most popular Symbols from various industries. You can add your own symbol files (.sdf) here. The **Translator** folder has files needed to convert 16-bit GENESIS files into the 32-bit GENESIS32 files.

3. The **Softlic** folder contains all the vital License files.

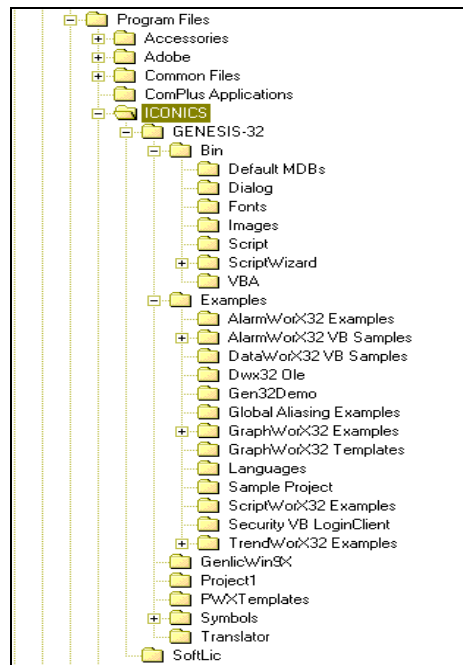


Figure 2.37

GENESIS32 Licensing

3

3.1 Introduction

The GENESIS32 Software products are available in various licensing options. The product is licensed based on the capability and functionality of the product. Licensing is in the form of a Site Key, which enables the capability and functionality of the purchased option. GENESIS32 software products use a software-based licensing scheme. An activated license is required to use the software in full production mode. This license designates which products may be used, as well as the I/O point-count limit used in the system. This document explains the concepts of the software licensing and shows how to install and activate the license.

3.2 Objectives

This lab exercise is intended to explain how to license GENESIS32. After completing this Lab you should know how to:

- Install the License Utility
- Authorize a temporary license
- Get your license online or by fax and authorize it
- Transfer a license between two computers.
- Kill the actual license
- Uninstall the License
- Monitor the License (License Monitor)
- Upgrading from 6.13 to 7.0 License

Configuration and Runtime Modes:

There are two distinct modes of operation within the GENESIS32 software modules: **Configuration** and **Runtime**.

Configuration is the product's capability to let you configure the system—to create graphic displays in GraphWorX32, for example, define which data to log in TrendWorX32, and configure which OPC points to monitor for alarming in AlarmWorX32, etc. Many refer to **Configuration** mode as "Development" mode, since the entire project has been designed and developed in this mode.

In **Runtime** mode, modules communicate with the actual I/O (Input/Output), talk to Network nodes, and animate the documents made by using **Configuration** mode. **Configuration** mode in GENESIS32 does not require an installed software license. You may develop your system on any machine.

Genesis32 Demo Mode:

Without a valid license installed in your PC, it is still possible to enter Runtime mode (described above). The software will check for a valid software license key on initialization. If none is found, GENESIS32 runs in Demo mode. It has the following limitations:

- It will only permit Runtime mode for two hours.
- Only 32 OPC tag connections will be updated.

Running past the two-hour limit generates a message stating that the demo time has been exceeded. You must then exit. On restarting, you will get another two-hour block of time in which to run. If there are more than 32 tags on a particular screen, gray stars (or whatever is configured as the **Point Failure** character) will appear in place of the actual I/O data.

Number of Active Data Points:

The number of active data points supported depends on the package. This is the number of live data points viewed from OPC servers running locally and on the network nodes, etc., connected to the client applications. This number is also known as **point count**.

Multi-User Licensing Support and Backup Server

When installing a multi-user license, the license will only be installed on one computer. This computer will be the Primary Security Server. As client applications are authorized, a count is managed which allows the maximum number of Client Units to run simultaneously. These client applications can run in different computers connected to the Primary Security Server. If one client exits Runtime, the same or a different client may then connect and run.

3.3 Installing the ICONICS Software License Utility

NOTE: You need to login as Administrator for Windows NT before installing GENESIS32 Software

If you are installing the Licensing Utility as a continuation of GENESIS32 installation, skip to step 3.

1. Insert the **GENESIS32 CD** into the CD-ROM drive.

2. You will see the CD introduction and the main menu. (If Auto-CD Insert Notification is enabled on your system, the CD introduction starts automatically. Otherwise, browse to your CD drive and run the "**RunMe.bat**" file. Select **Software** from the menu.
3. Select **Licensing** from the software selection menu, as shown below:

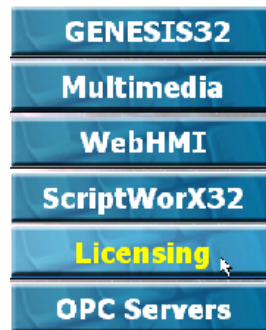


Figure 3.1

4. The ICONICS Software License Utility will start and display a **Welcome screen**, as shown below. Click **Next** to continue.

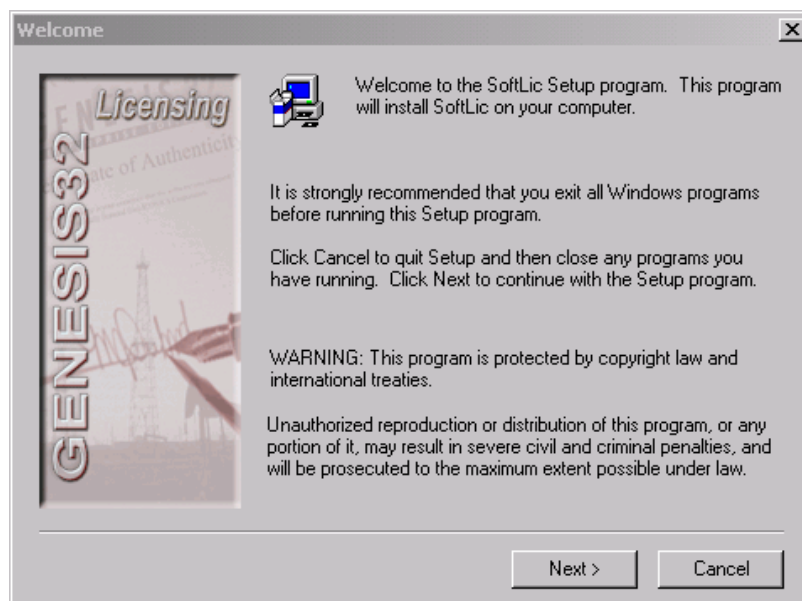


Figure 3.2

5. The setup will display the **ICONICS Software License Agreement**. Click **Yes** to agree and continue with the installation.

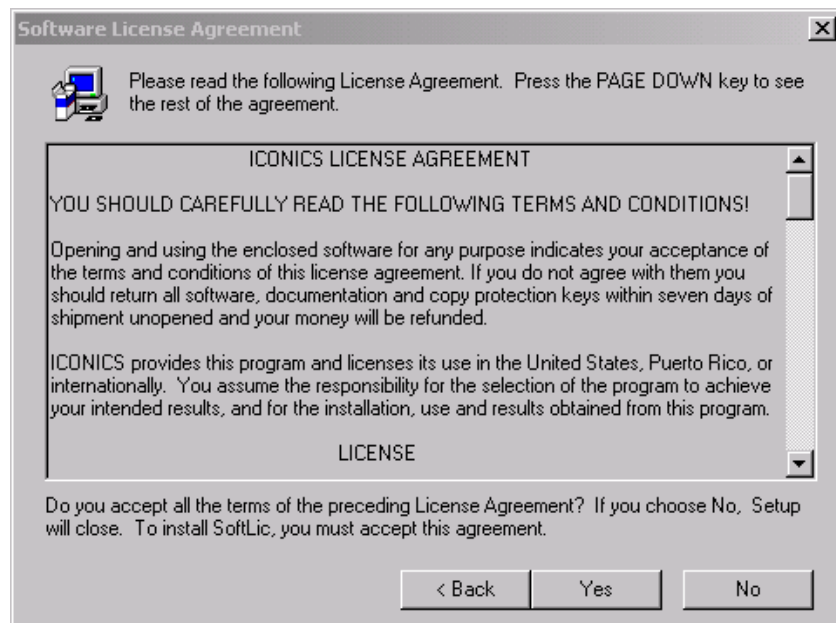


Figure 3.3

6. The **User Information** dialog will be displayed next, as shown in the figure below. Type in your name and the name of your Company. **Click Next** to continue.

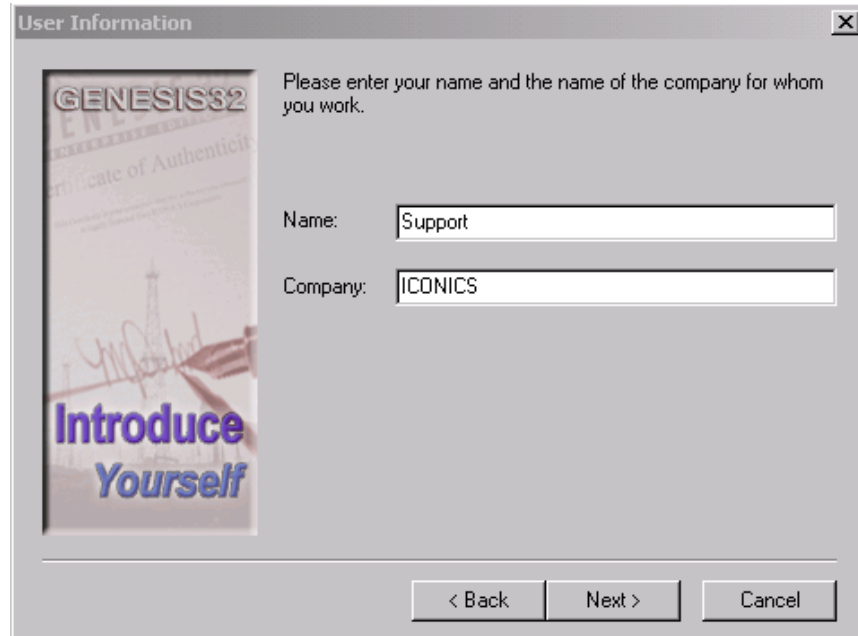


Figure 3.4

7. Choose the destination directory for the installation. The installation usually defaults to "C:\Program Files\ICONICS\SoftLic". If you prefer to install the

License Utility in a different directory **click Browse** and select your destination. **Click Next** to continue after you make your selection.

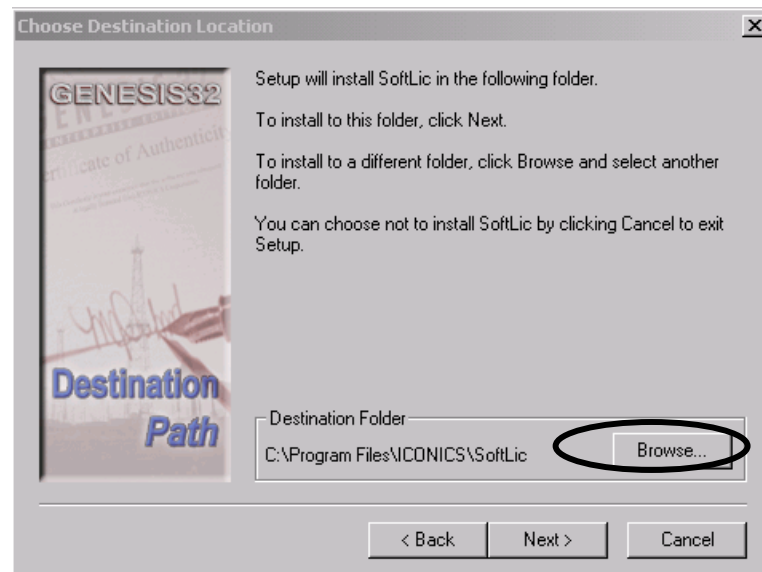


Figure 3.5

8. The setup will also create a program folder and copy all the shortcuts related to the License Utility into that program folder. The default program folder is **ICONICS Software Licensing**. You can specify a different folder if you want. **Click Next** to continue.

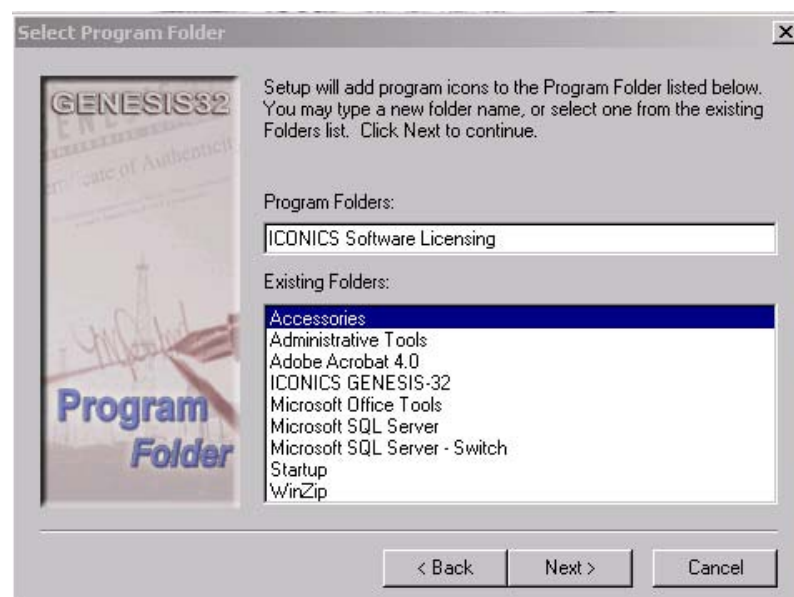


Figure 3.6

9. The setup will now show you an important **License Notice**. See the figure below. **Click Next** to continue.

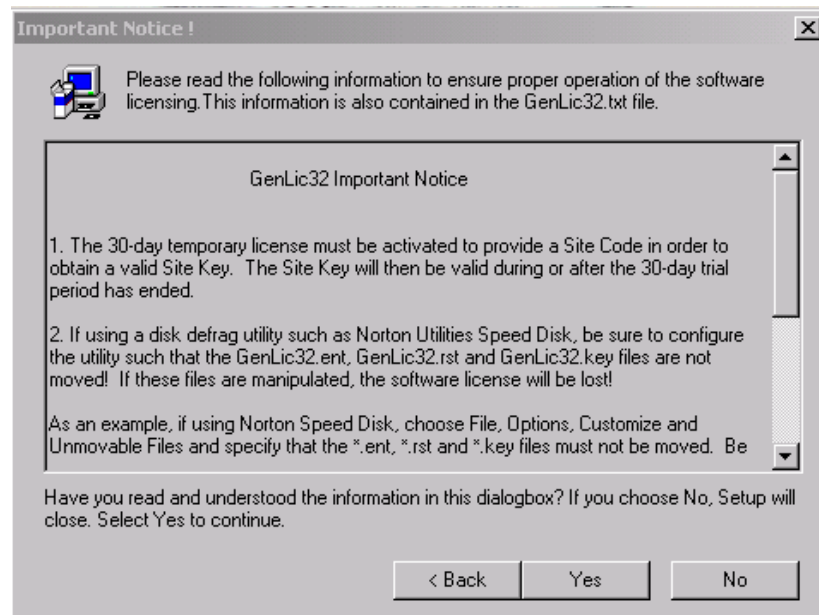


Figure 3.7

10. You have to accept the notice for the installation to continue. **Check the box** and **click Next** to continue.

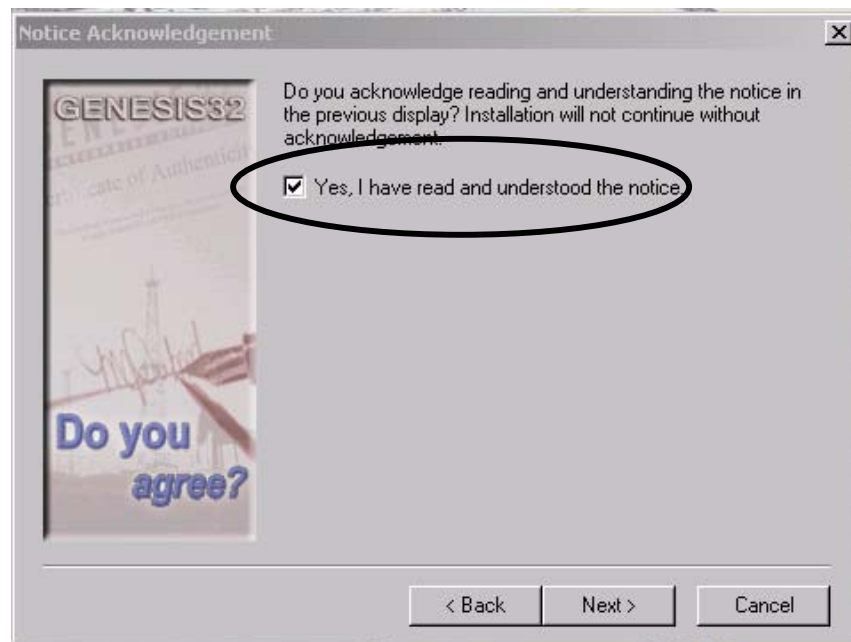


Figure 3.8

11. The installation will now continue. A status bar will be shown which indicates the progress of the installation.

12. After installation, it will show 2 check boxes. One is the Readme file and the other is to launch the License Utility. You can Launch the License utility from here, or skip if you want to do it later. **Click Finish** complete the installation. See the figure below:

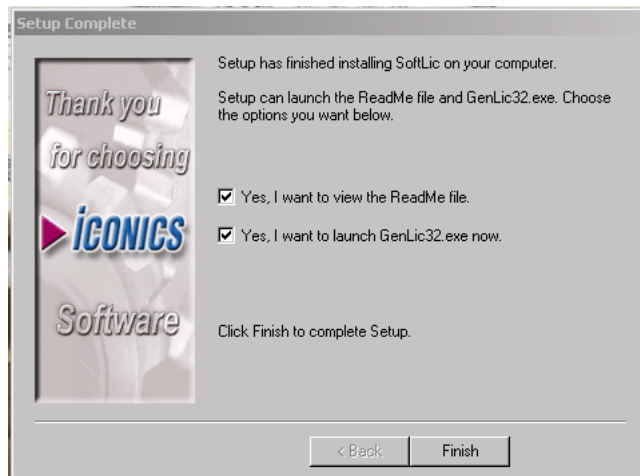


Figure 3.9

3.4 Launching Software Utility and Activating Temporary License

NOTE: Set the System Date and Time properly before installing the Software Licensing Utility. Changing the time and date may affect time-limited Licenses. Upon successful installation of GENESIS32, the installation wizard automatically creates a directory for the GENESIS32 Software Key licensing system.

NOTE: It is also advisable to not tamper with the system's clock if using a time-limited license. Setting the time back more than one hour will invalidate the license.

1. Alternatively you can also launch the License Utility from **Start – Programs – ICONICS Software Licensing – License utility**. See the figure below:

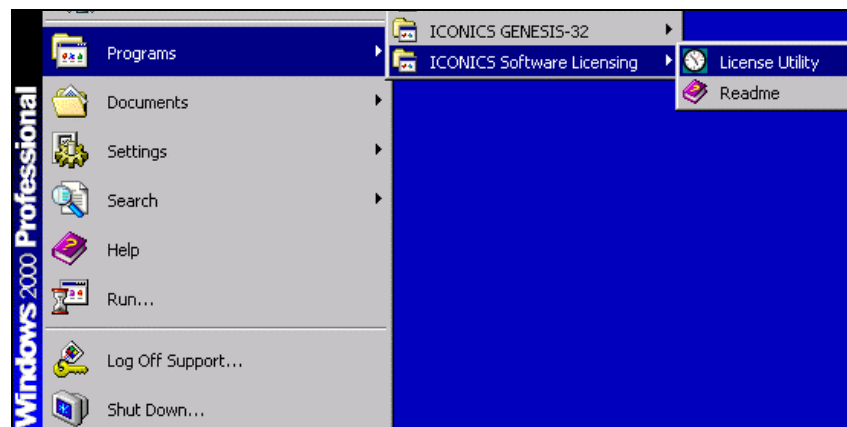


Figure 3.10

2. When you launch the License Utility the following Message box will appear informing you that License is not present. See the figure below:

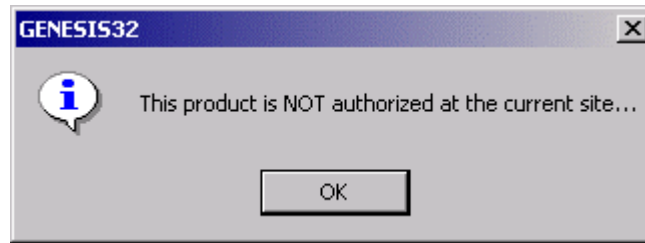


Figure 3.11

3. After you **click** on **OK**, another window will popup giving you 3 options. This message will come up every time you launch License Utility until you activate the temporary license or authorize a permanent license. The temporary license is a one-time license and is for a period of 30 days. This can be used for product evaluation and trail purposes.
 - To execute the temporary license **click YES**.
 - To transfer a license to this PC, **click NO**.
 - If you prefer to continue in demonstration mode, **click EXIT**.



Figure 3.12

4. **Click Yes** to activate the Temporary license. The following message box will appear confirming that the action is completed. See the figure below:

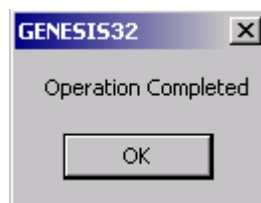


Figure 3.13

5. The **License Utility** will also displayed as follows:

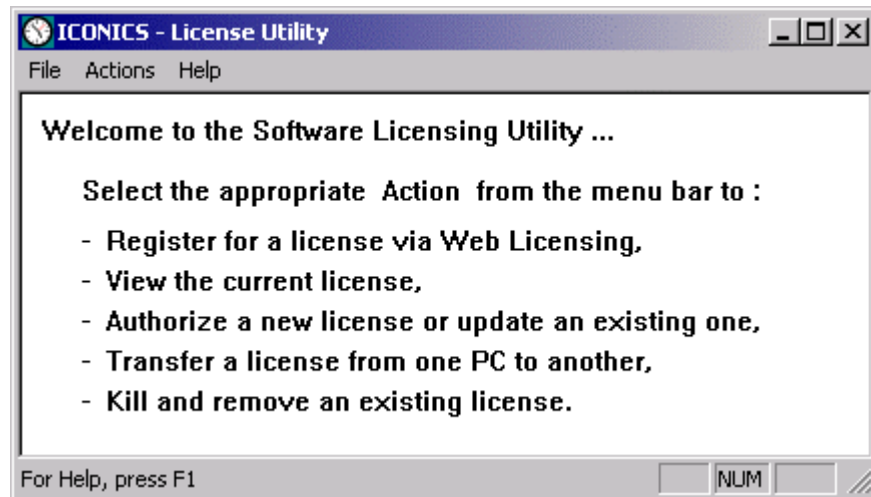


Figure 3.14

Viewing the License

6. To view the License go to **Actions Menu** and **click on View License**. See the figure below:



Figure 3.15

7. The License Dialog will appear as shown in the figure below: It gives information about
- Type of License
 - Restrictions on the License
 - Number of copies licensed (allowed and used)
 - Number of Clients Units supported by this license
 - Site Code and Site Key

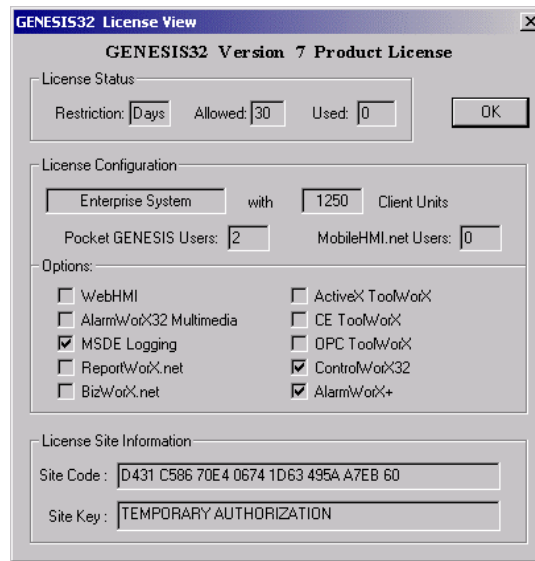


Figure 3.16

3.5 Authorizing a Permanent License for GENESIS32

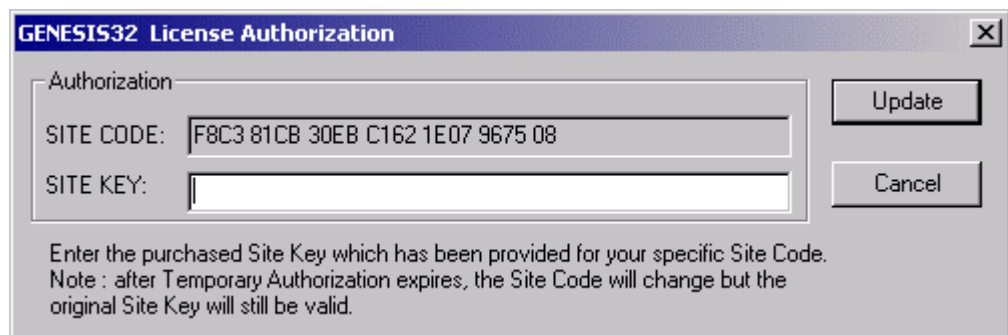
There are two options to register and obtain a site key for the PC running the License Utility. Regardless of the method selected, the registration and license of GENESIS 32 product(s) is achieved using a three-step process:

- The user identifies all products that will run on this PC as well as the Site Code (generated during the registration process) for this PC.
 - ICONICS validates the purchase of the products to be installed either by using the provided Product Registration Number(s) shipped with the purchased CD. Once validated, ICONICS generates and returns a corresponding Site Key number that will activate the proper products for use on this PC.
 - The user enters the provided Site Key number via **Actions-Authorize License** and activates the license
1. In the License Utility go to **Actions – Menu** and select **Register for a license**. See the figure below:



Figure 3.17

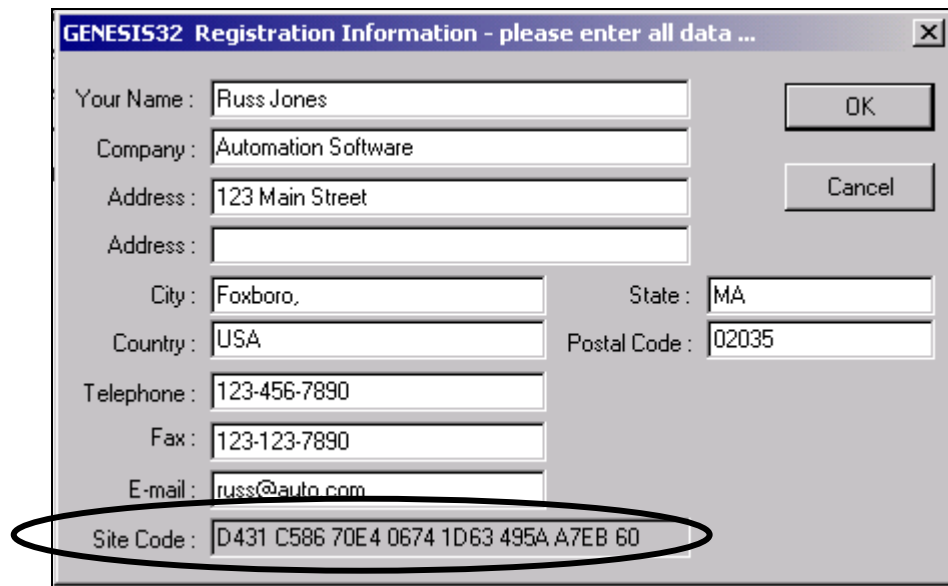
2. We have 2 options, Registering via Internet or via Email.
 - If this PC has access to Internet, the user has the ability to select Express Web Site Registration and attach to the ICONICS automated Registration Web Page. This will allow the user to specify the products to be installed on their PC
 - If the Express Web Site method is selected, the License Utility will launch the License Authorization dialog in preparation to accept a Site Key that will be provided by the Registration Web Page. The License Utility will also launch the ICONICS Registration web site. Return to the License Authorization dialog and Copy the Site Code to the clipboard (ctrl C) for later use

**Figure 3.18**

3. Return to the launched ICONICS Registration Web Page and follow the directions given. When prompted for your Site Code Paste (ctrl V) your Site Code that you just copied to the clipboard.
4. When this process is complete, you will be given a Site Key number. Copy this Site Key to the clipboard (ctrl C). Return to the License Authorization dialog in the License Utility and Paste (ctrl V) your Site Key in the appropriate field. Click Update to complete the registration process.
5. Rather than connect to the Internet, the user can instead specify the products to be installed on their PC and then return the generated information via fax or email to ICONICS.

**Figure 3.19**

6. If the Fax / Email method is selected, the **GENESIS 32 Registration Information dialog** appears next as shown below. The Site Code generated for your computer by the Licensing Utility will be displayed at the bottom.



GENESIS32 Registration Information - please enter all data ...

Your Name : Russ Jones

Company : Automation Software

Address : 123 Main Street

Address :

City : Foxboro, State : MA

Country : USA Postal Code : 02035

Telephone : 123-456-7890

Fax : 123-123-7890

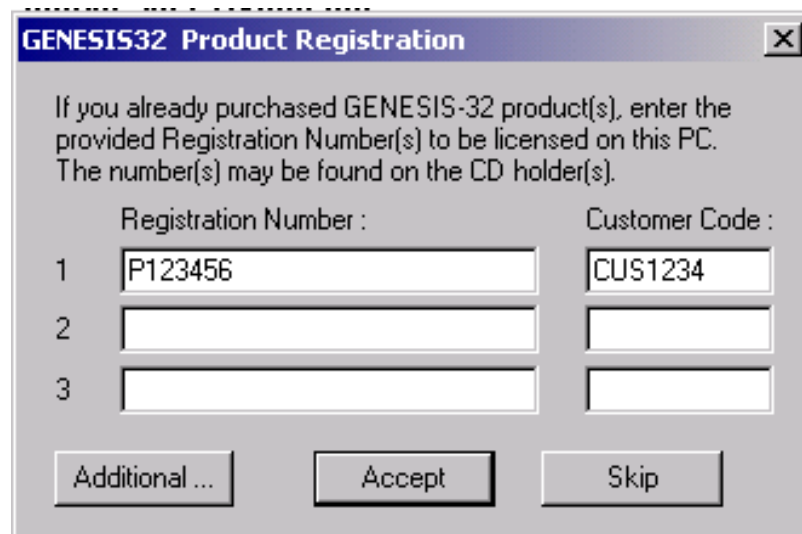
E-mail : russ@auto.com

Site Code : D431 C586 70E4 0674 1D63 495A A7EB 60

OK Cancel

Figure 3.20

7. Dialog Box – **Product Registration** – will be displayed next. If the products to be installed on this PC have already been purchased, enter the Product Registration ID number(s) provided with the CD holder(s) as shown below.



GENESIS32 Product Registration

If you already purchased GENESIS-32 product(s), enter the provided Registration Number(s) to be licensed on this PC. The number(s) may be found on the CD holder(s).

	Registration Number :	Customer Code :
1	P123456	CUS1234
2		
3		

Additional ... Accept Skip

Figure 3.21

8. If the products have not been purchased yet, press the **Skip** button to proceed to the next dialog shown below. Here you can actually place an order to purchase the products.

Figure 3.22

9. If a Product ID has been entered, **press Accept** and the next dialog to appear will be Registration Process Completed dialog. You may now choose which method you prefer to use to send your information to ICONICS.

Figure 3.23

10. After receiving this information from you, the ICONICS Order Processing Department will provide you with the unique Site Key for your system through fax or e-mail. Once you have your Site Key you can authorize your software license

Authorizing the Software License

11. After you get your **Site Key**, open License Utility. Go to **Actions menu – Authorize License** and type (paste) your Site Key in the box provided. The license will be shown as in the figure below, with the new site key.

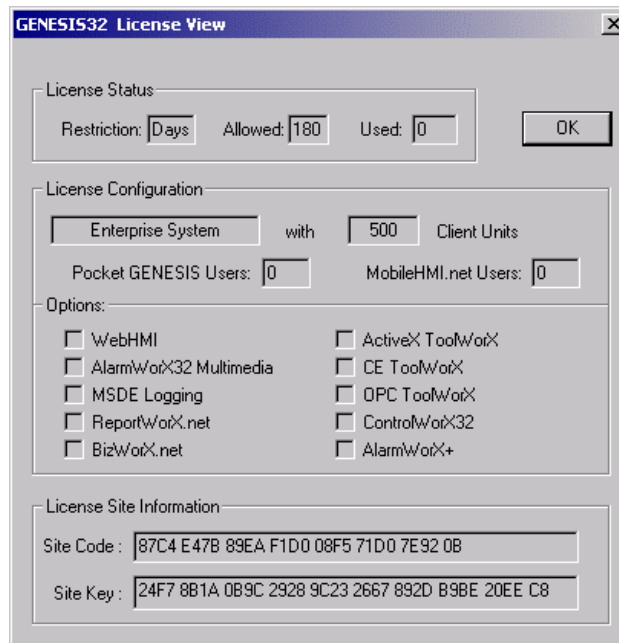


Figure 3.24

3.6 Transferring a License

1. The license can be transferred using a floppy disk. The user can transfer a software license from one PC to another, or a single copy of the software license if multiple copies exist on the same PC. The Licensing Utility must be installed **FIRST** on the target PC, so the user can perform the license transfer. License transfer requires that the target PC is an unauthorized site.
2. Go to **Actions menu** and select **Transfer license**. The dialog opens as shown in the figure below:

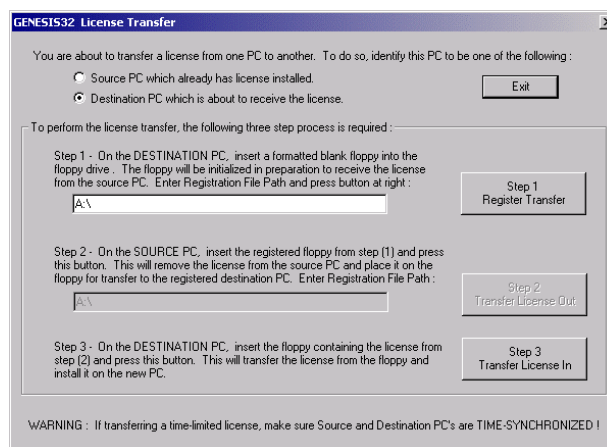


Figure 3.25

3. At the target PC, a floppy disk has to be prepared for receiving a license. Format the floppy disk using the target computer. If you do not have a formatted floppy disk, you can quit the **License Transfer** dialog box and run it later.
 4. Select '**Destination PC which is about to Receive License**' option from the dialog box. Notice Step 1 of the dialog box is enabled. The path will default to A:\. If your floppy disk drive letter is different, you can type it in the path field.
 5. Click the '**Register Transfer**' button. This will prepare the floppy disk for transfer.
 6. Insert the prepared floppy disk in the **Source computer** and run the License Utility Program. Select **Actions – Transfer License** from the menu bar of the License Utility Program and select **the Source PC, which already has License Installed** option. Notice that Step 2 in the dialog box is enabled. The path will default to A:\. If your floppy disk drive letter is different, you can type it in the path field.
 7. Click the '**Transfer License Out**' button on the dialog box. This will transfer the license from the Source PC to the floppy disk.
 8. Use the License Utility's **Actions-Transfer License** on the target computer to transfer the license from the floppy disk to the target computer.
 9. Click the '**Transfer License In**' button now. This will transfer the license from the floppy disk to the target computer.
 10. Reboot your target computer for the changes to be effective
- ✓ **NOTE: Do NOT attempt to transfer licenses between 6.1x & 7.0 machines. Transfer always works between same versions.**

3.7 Killing an Existing License

1. If you do not have 2 machines to transfer license between, then killing a license may be required when you would like to CREDIT your license to our web site for later use. To kill or delete the existing software license, select the Actions-Kill License menu from the Licensing Utility.

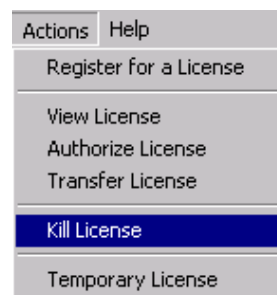


Figure 3.26

2. Using this option, the user can remove the current software license from the current machine. You also need to contact ICONICS Order Processing Department to get a special password for killing your license. A warning message will be displayed on the screen as shown below

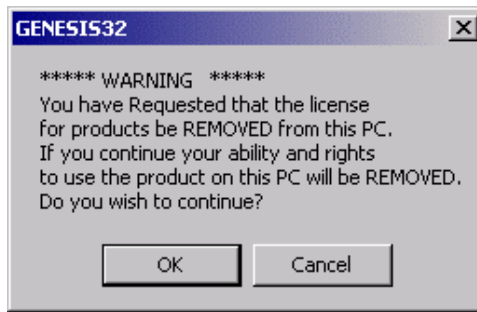


Figure 3.27

3. Click 'OK' to continue or 'Cancel' to exit. Clicking 'YES' will display another warning message as shown below. If you kill your license, you need to get a new license from ICONICS to restart your GENESIS32 product.

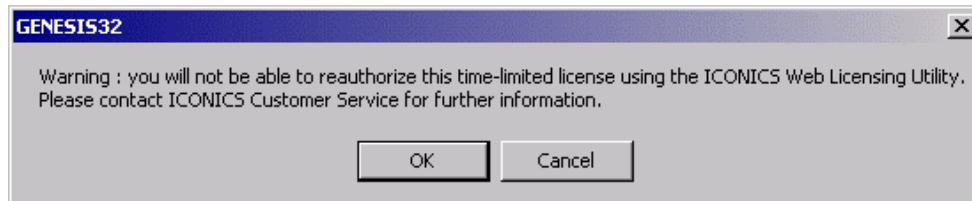


Figure 3.28

4. Clicking 'OK' will display the following dialog box. Click 'Cancel' if you do not want to continue..

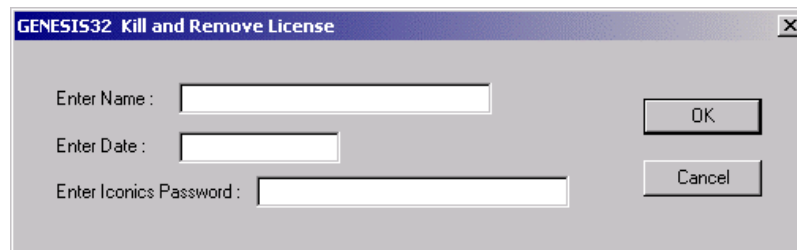


Figure 3.29

5. Enter your name, date and the password you received from ICONICS to kill the license on the above dialog box and then click 'OK'. Click the 'Cancel' button if you do not want to kill your license. **This is the last step before you could exit without killing your license**

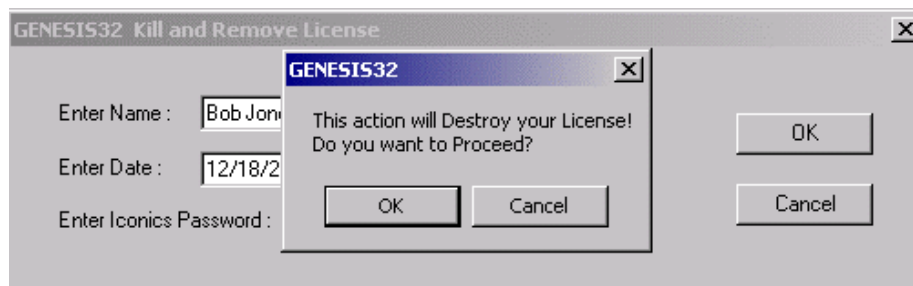


Figure 3.30

6. After killing the license, it will show you the Kill Confirmation code. See the figure below:

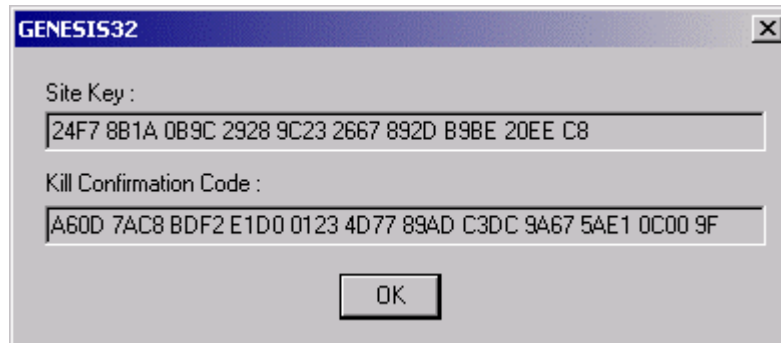


Figure 3.31

7. Upon successful deletion, a file called **KILL.TXT** will be created in the SOFLIC directory, which has name, date, and last authorized key and confirmation code.

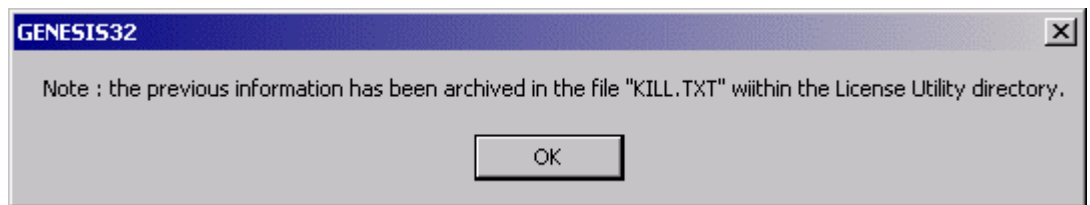


Figure 3.32

Keep this file! You will have to use the name, date, and last authorized key and confirmation code that it contains to confirm that you've killed your license (either via our Order Entry Department, or from the Web site).

NOTE: If you uninstall the Software License Utility, it will delete this KILL.TXT file. So make sure to copy this file or note the confirmation code before uninstalling the Software License Utility. You also need to give this code to ICONICS for the license removal process to be complete.

NOTE: Also, a time-limited license CANNOT be credited back to the Web-based License Generator using a Kill Code. You must call the ICONICS Order Processing department.

NOTE: To add products to an existing license it is not required to kill the current license.

3.8 Uninstalling ICONICS Software Licensing

The ICONICS Licensing Utility can be uninstalled or removed from the system by removing with it all changes and modifications processed by the Installation program.

NOTE: If you have a valid GENESIS32 License in your computer, you need to transfer that license to another computer before uninstalling the Licensing Utility. You need to install the Licensing Utility on the second computer first. You can, however, install the Licensing Utility without installing the GENESIS32 Software

NOTE: Simply uninstalling GENESIS32 Enterprise Software (or its components) will **not** uninstall the Licensing software. Your valid license will remain activated on your PC.

1. To uninstall ICONICS Software Licensing, go to **Start – Settings – Control Panel and select Add/Remove Programs**. ICONICS Software Licensing will be listed as shown in the figure below:

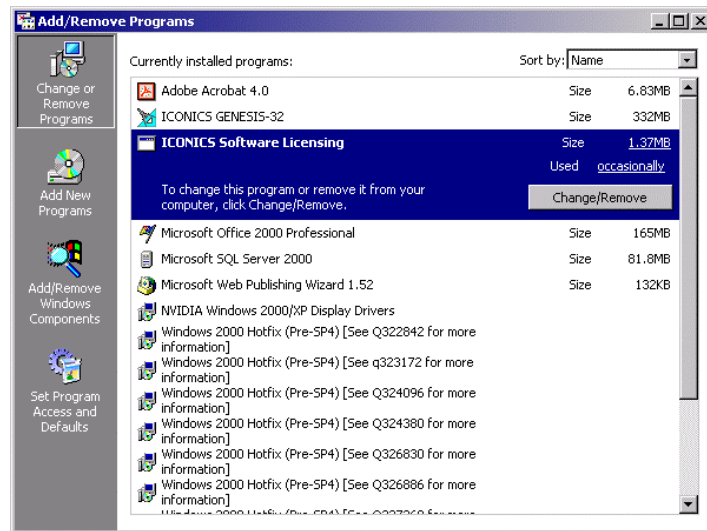


Figure 3.33

2. Click on the **Change/Remove button** to uninstall.
3. At the prompt, click **Yes** to confirm that you want to remove ICONICS Software Licensing and all of its components.

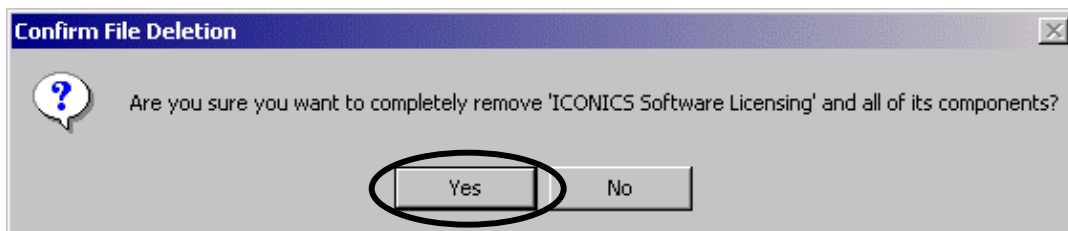


Figure 3.34

4. If you have a **valid license** on your computer, a dialog box as shown below will be displayed. Click **OK** and transfer the license to another computer. Refer to **Transferring a Software License** section.

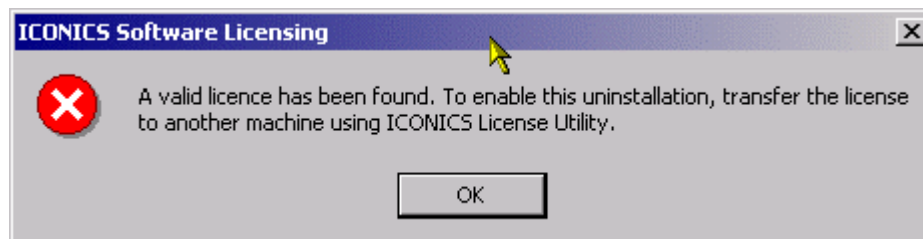


Figure 3.35

5. When the files are removed, the uninstall program indicates that the process is complete. Click **OK**. If the **Details** button is shown on the dialog box, some files might not have been uninstalled. Click on the **Details** button to see the list of files that were not successfully uninstalled. In this case, you need to restart your computer before installing the product again.

3.9 License Monitor

Since the number of applications available for use depends on the number of available Client Units, it is necessary for you to be able to view the number of Client Units in use and the number of Client Units available. Along with the installation of ICONICS products, the GENESIS32 License Monitor is installed to allow you to view the use of purchased Client Units. **The License Monitor** consists of two tabs: **License** and **Events**.

License Tab

The **License** tab of the ICONICS License Monitor, displays the start and current time of use and (when in demo mode) when the demo is over. This tab indicates the number of available and used Client Units and points. The **License** tab also displays the state of the license, the licensed nodes that are running GENESIS32 application, and the version of GENESIS32 that is currently using Client Units.

License type. The **State** field indicates the type of license that is being used, such as a temporary license or a permanent license. The start time is the time the License server began execution. The current time reflects the current local time of the License server. The **Demo Over** field depends on the type of license as follows:

License	Demo Over
No license	Time and date that demo mode will end
Temporary license	Number of days remaining on a license
Valid (permanent) License	Field is blank

Client Units and points

The **License** tab also provides information about the Client Units and points used to run specific GENESIS32 applications. The **Client Units** field lists the number of Client Units that are currently being used in all GENESIS32 applications, the number of available Client Units (which are not currently in use), and the total number of Client Units, which is equal to the number of available Client Units plus the number of Client Units in use. For example, if you have 700 total Client Units and 300 Client Units are currently being used, then 400 Client Units are available. Similarly, the **Points** field provides information about the number of process points that are currently being used (in runtime mode) in all GENESIS32 applications

Nodes. The fields at the bottom of the **License** tab provide information about the licensed nodes. You can specify **Primary** and **Backup** nodes for the license. The **Controlling Node** field indicates which node is currently active. If the primary node fails, the backup node will become the active node and will be shown as the controlling node. If no primary or backup node is specified, the local computer will be used as the default node.

NOTE: When GenBroker communication is used, license redundancy is not supported, so the **Node** field will be grayed out.

NOTE: An empty primary or backup node is equivalent to the local node name. The field at the bottom of the **License** tab lists information about the current activity of each licensed node. For each node that is using a client application, such as GraphWorX32, this field displays the node name, the application that the node is running, the number of Client Units per application that the node is using, and the total number of Client Units currently being used by all nodes. The total number of Client Units currently being used is reflected in the **Client Units** field.

NOTE: Compare the number of Client Units available with the list in the **Licensing Options** section to see what applications you can still run.

NOTE: If you installed the Browser Station when installing GENESIS32, the **Browser Station** box will be checked

Genesis32 License Monitor

License | Events

Time: Start: 12/18/2002 6:06:59 PM Current: 12/19/2002 11:41:26 A Demo Over: 365 Days

	In Use	Available	Total
Client Units:	20	1480	1500
Points:	14	64986	65000
Pocket Nodes:	0	2	2
Mobile Users:	0	0	0

State: Valid License About...

Controlling Node: SUPPORT-2KXP ☐ Browser Station Version: 7.0.117

Node

Primary:

Backup:

Node	Application	Client Units	Total
SUPPORT-2KXP	AWXsvr32	20	20

OK Cancel Apply Help

Figure 3.36

Events Tab

The **Events** tab of the License Monitor allows you to relay events from the GenEvent server to a **Primary** or **Backup** node. The node that is specified will log events to the GenEvent logger. If no primary or backup node is specified, the local computer will be used as the default node for event logging. The GenEvent server exposes all events sent to it via the OPC Alarm and Events (AE) interface. OPC AE clients like the AlarmWorX32 Viewer and

Logger can subscribe to the GenEvent server to view and log these events. You can also configure settings for logging events to the NT Event Logger.

The **NT Event Log Applications** list box allows you to select which GENESIS32 applications will be logged to the NT Event Logger. To select an application to be logged, simply check the box next to the application. It is also necessary to set the **NT Event Log Severity Level** if using NT. The number you enter in this field is the minimum severity level required for an event to be logged to the NT Event Logger.

For example, if the severity level is set to 500, as shown below, only events with a severity level greater than 500 will be logged to the NT Event Logger.

When data are relayed to another node for event-logging the local computer (node) is bypassed. However, if you still want to log to the NT Event Logger, check the **Always Write to Local NT Event Log** check box. This will ensure that events are still logged to the NT Event Logger on the local computer even though the local computer is relaying events to another nodes.

NOTE: The NT Event Logger configurations do not apply to Windows 95 and Windows 98.

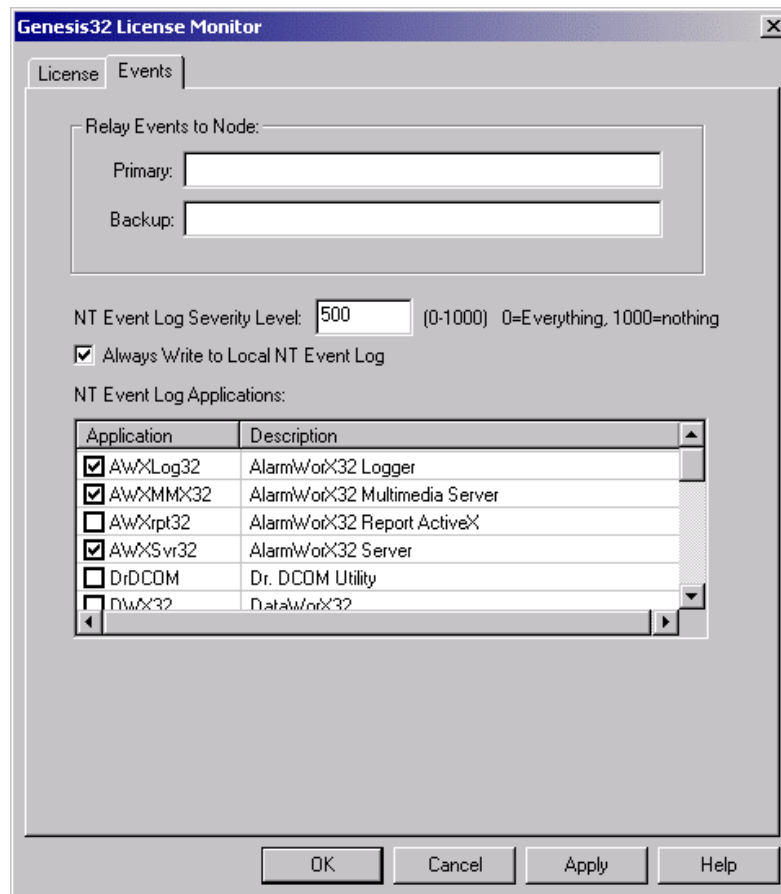


Figure 3.37

3.10 Upgrading Software Licensing from 6.13(x) to 7.0

If you wish to upgrade your ICONICS Software License, simply install the new version over the existing version. It is NOT necessary to uninstall the old version before installing the new version.

1. When you are installing Genesis 7.0 and if you already have 6.1x version Software Licensing, first you have to upgrade your License Utility to 7.0. If you do so, your existing license will become 30 temporary license for 7.0. Otherwise you cannot proceed with 7.0 Genesis installation. See the figure below:

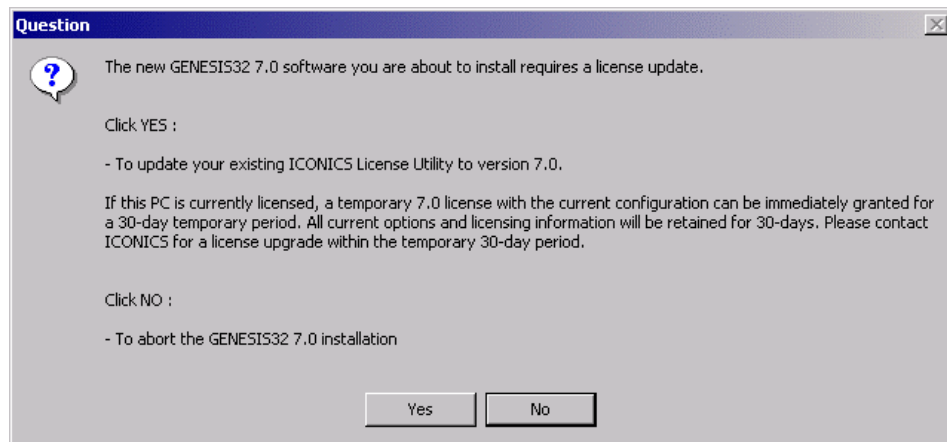


Figure 3.38

2. If you **click No**, the Installation will exit. If you **click yes**, it will upgrade the existing license to 7.0
3. After the 7.0 License is installed, if you launch License Utility, the following window will popup.

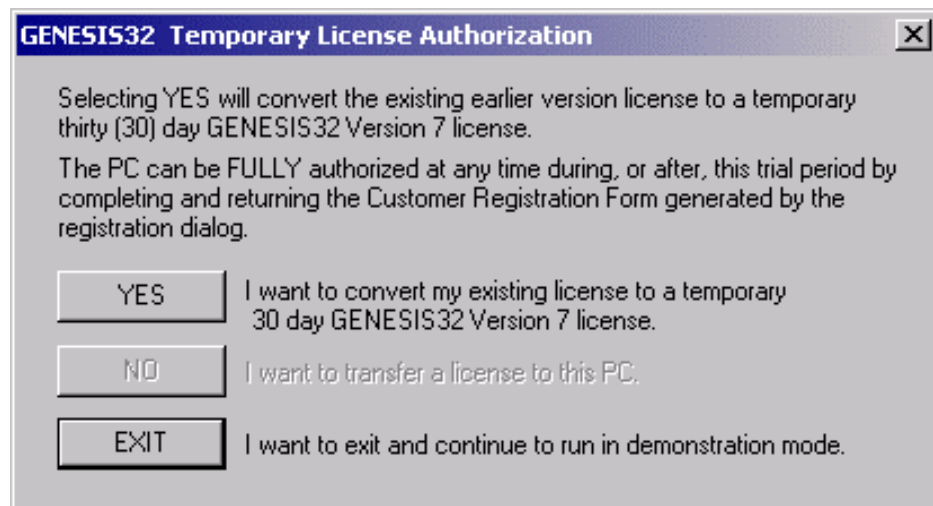


Figure 3.39

4. Click **No**, to continue in **Demo mode**. If you click **Yes**, your existing license will be converted into **30 day temporary license**. See the figure below:

GENESIS32 License View

GENESIS32 Version 7 Product License

License Status:

Restriction: Days Allowed: **30** Used: 0 OK

License Configuration:

Enterprise System with 1500 Client Units

Pocket GENESIS Users: 2 MobileHMI.net Users: 0

Options:

☒ WebHMI	☐ ActiveX ToolWorX
☒ AlarmWorX32 Multimedia	☒ CE ToolWorX
☒ MSDE Logging	☐ OPC ToolWorX
☐ ReportWorX.net	☐ ControlWorX32
☐ BizWorX.net	☐ AlarmWorX+

License Site Information:

Site Code : 5C54 C967 C8D7 92EC DF33 F278 70DA 9D

Site Key : 5283 2267 DFED 1EEF 0F33 45E9 67C3 BD89 1C9C BC

Figure 3.40

Project Management with ProjectWorX32

4

4.1 Introduction to ProjectWorX32

GENESIS32 contains numerous applications with multiple components, requiring a well-trained user in order to successfully create, integrate, deploy, and manage projects. Each of these components requires complex setup of many different types of configuration files, databases, and OPC servers, as well as runtime and security settings. To simplify the management and deployment of the broad spectrum of GENESIS32 applications, ICONICS has introduced ProjectWorX32, a sort of "super configurator" that integrates all GENESIS32 applications into a single, easy-to-manage format. The ProjectWorX32 user interface is basically a container embedded in the Microsoft Management Console (MMC). The ProjectWorX32 console conveniently consolidates all of your GENESIS32 files in one easily accessible location, enabling you to:

- Organize all GENESIS32 application files into separate projects.
- Create new GENESIS32 application files and OPC server configurations.
- Import application files into projects.
- Start and stop GENESIS32 applications.
- Pack project files into a single, compressed file, and unpack project files for easy deployment to multiple computers.
- Activate entire projects into runtime mode.
- Control the layout of windows using the Screen Manager.
- Configure security settings to password-protect projects.
- Back up project files to Microsoft® Visual SourceSafe.
- Search for and replace machine names and OPC tags throughout all project files using a global find/replace utility.
- Control and monitor runtime functions for all applications using GenTray.
- Launch GENESIS32 system tools.
- Import and manage third-party applications.
- Publish projects to the Web.
- Generate comprehensive reports for all files and projects.

4.2 Objectives

In this chapter we will learn about the following:

- Managing system tools using ProjectWorX32
- Creating a new project with ProjectWorX32
- Managing and running ICONICS applications directly from ProjectWorX
- Importing files into a project
- Packing and unpacking a project
- Overwriting existing projects
- Backing up projects using Microsoft Visual SourceSafe

4.3 System Tools

Open ProjectWorX32 by going to Start→Programs→ICONICS GENESIS-32→ProjectWorX32.

The System Tools tree of the ProjectWorX32 console is a snap-in from which you can conveniently launch all of the available GENESIS32 tools:

- Dr DCOM
- GenBroker Configurator
- GenTray
- License Monitor
- MSDE Manager
- OPC DataSpy
- OPC Simulator
- Screen Manager
- Secure Desktop Configurator
- Security Configurator
- Security Login
- Universal Tag Browser

Figure 4.1 shows the user interface of the System Tools tree of the ProjectWorX32 console. To launch a tool, double-click the tool in the right-hand pane. We will discuss some of these tools in this class; for information on those tools not mentioned here, refer to the ProjectWorX32 Help files, or to the other training classes offered by ICONICS.

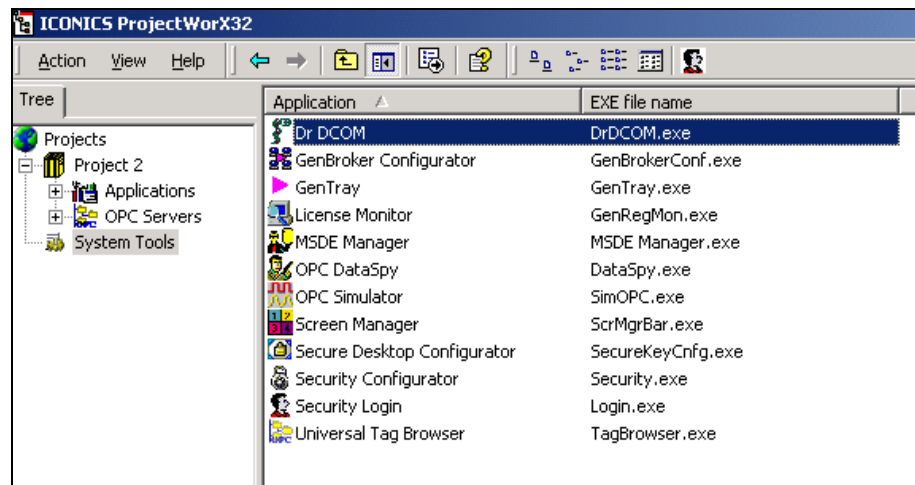


Figure 4.1

4.4 Creating a New Project

We will start by creating a new project in ProjectWorX32 from which we will create and manage all of our ICONICS applications directly.

1. In the tree control of ProjectWorX32 (left-hand pane) select **Projects**, right click and select **New Project**, or go to **Action→New Project**.

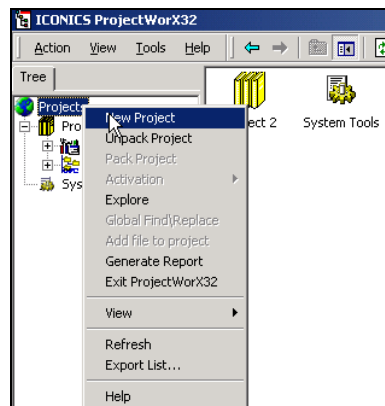
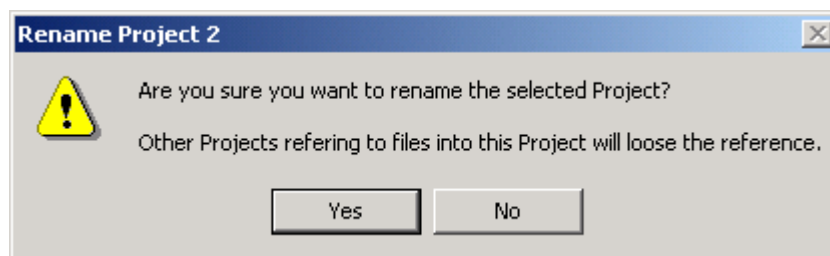


Figure 4.2

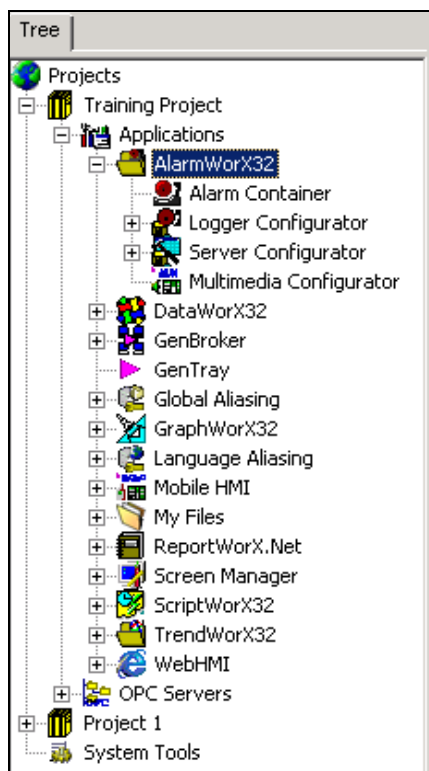
2. The project name by default will be something like **Project 2** depending on how many projects you have created before. Rename the project **Training Project** by selecting the project and then clicking once on the project name so you can edit it, or by right-clicking and selecting **Rename**.
3. You will receive a message (**Figure 4.3**) confirming that you want to rename the project, since other projects referring to this one could lose the reference. Click **Yes**; we have not made any references to this project.

**Figure 4.3**

4. Note that when a new project is created, management capabilities for all ICONICS applications are automatically added.

4.5 Managing and Running Applications

The Applications tree for each project, contains all GENESIS32 client applications and components, including GraphWorX32, AlarmWorX32, TrendWorX32, DataWorX32, ScriptWorX32, MobileHMI, Screen Manager, GenBroker, and ReportWorX.NET, as shown in Figure 4.4. Each of these applications has several additional modules or components (e.g. AlarmWorX32 Container, Logger Configurator, Server Configurator, and Multimedia Configurator).

**Figure 4.4**

For each component you can create a new file, add a file to the project, add a file in the project to SourceSafe (see **Section 4.9**), or generate a report.

4.5.1 Creating a New Application File

Each time you create a new application file inside a project in the Applications tree of the ProjectWorX32 console, the new file is saved to the main project directory. Although the file types vary with each GENESIS32 application (e.g. display files, Microsoft Access configuration databases, etc.), the following method for creating new application files is the generally the same for each application in the ProjectWorX32 console. An example follows using the AlarmWorX32 Container:

NOTE: Microsoft SQL Server configuration files are handled differently.

1. Right-click the desired component (e.g. Alarm Container) in the application tree (e.g. AlarmWorX32) in the ProjectWorX32 console and select New [File Type] (e.g. New AWX Container) from the pop-up menu, as shown in **Figure 4.5**.

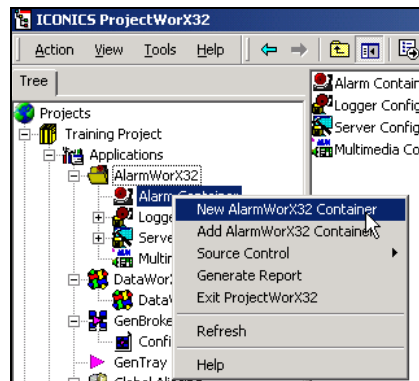


Figure 4.5

2. Give the new file a name, as shown in the **Figure 4.6**. Click OK.

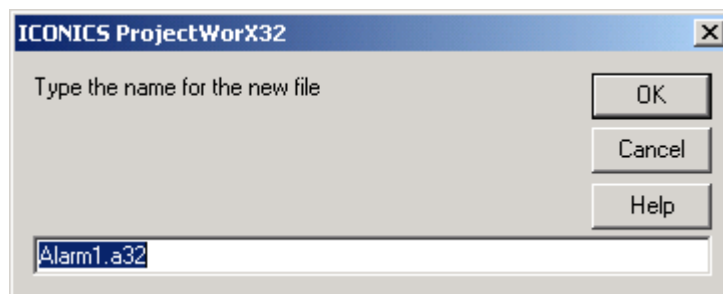


Figure 4.6

3. The new file appears in the component tree (in this case Alarm Container) and is displayed in the right-hand pane of the ProjectWorX32 console, as shown in **Figure 4.7**. ProjectWorX32 automatically launches the new file in the selected application (Alarm Container).

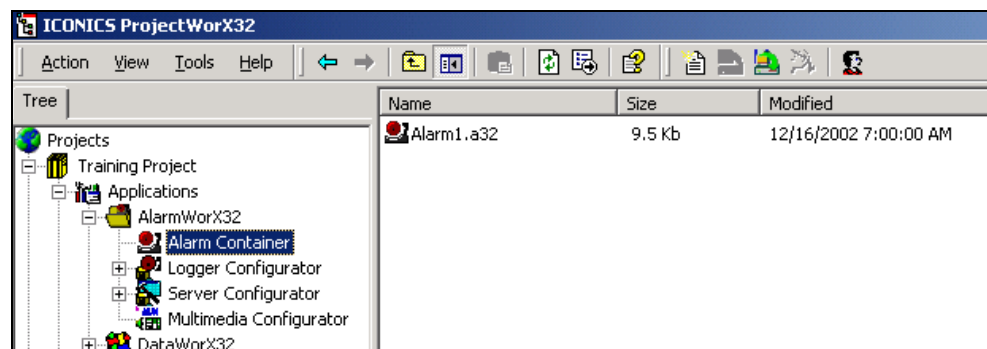


Figure 4.7

4.5.2 Adding an Application File to a Project

When you add an existing application file to a project in the Applications tree of the ProjectWorX32 console, you have the option of copying the file to the project folder or running the file from its current location. Although the file types vary with each GENESIS32 application, the following method for adding existing application files is generally the same for each application in the ProjectWorX32 console.

NOTE: The method for adding Microsoft Access configuration databases is generally the same as the method for adding application files.

An example follows using the AlarmWorX32 Container:

1. Right-click the project and select **Add [File Type]** from the pop-up menu, as shown in **Figure 4.8**.

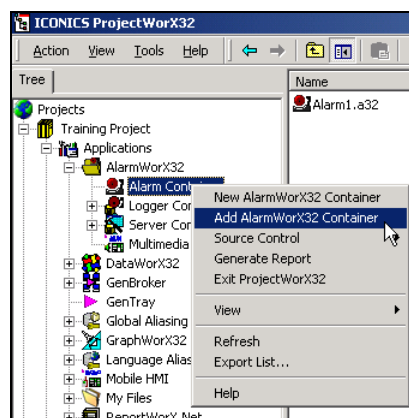


Figure 4.8

2. In the Add file dialog box, choose a directory and a file to import, as shown in **Figure 4.9**. Click **Open**.

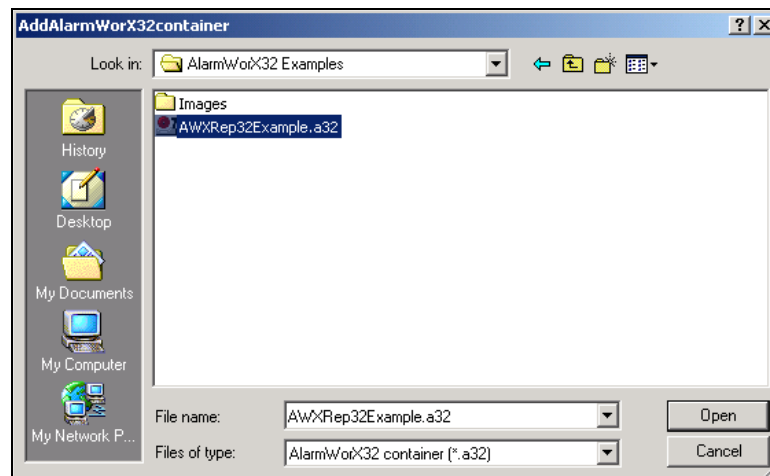


Figure 4.9

3. When you add an existing application file to a project, you can copy the file to the local project directory instead of running the file from its current location. To copy the file to the project folder, click **Yes** in the message box shown in **Figure 4.10**. Otherwise click **No** to run the file from its current location; the file's directory path is referenced in the right-hand pane of the ProjectWorX32 console.

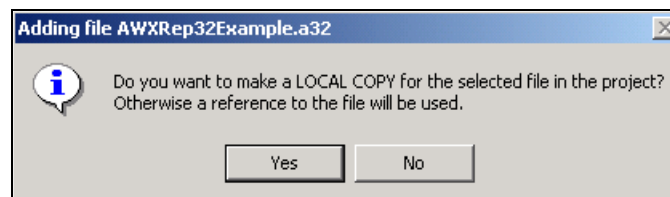


Figure 4.10

4. The file appears in the component tree (in this case Alarm Container) and is displayed in the right-hand pane of the ProjectWorX32 console, as shown in **Figure 4.11**.

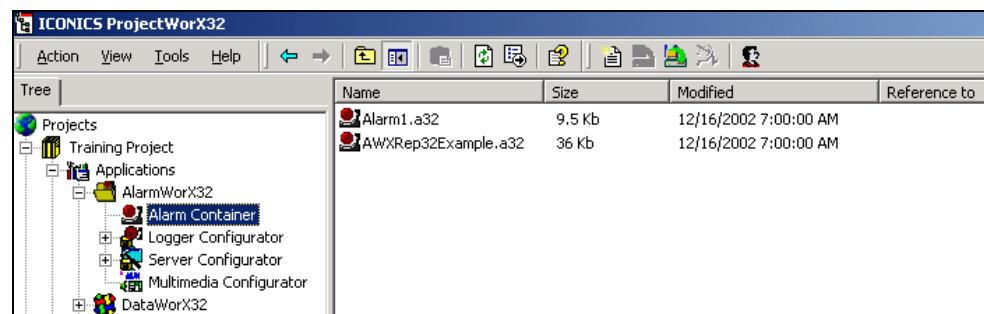


Figure 4.11

5. To launch the application file, either double-click the file or right-click the file and select **Open** from the pop-up menu, as shown in **Figure 4.12**.

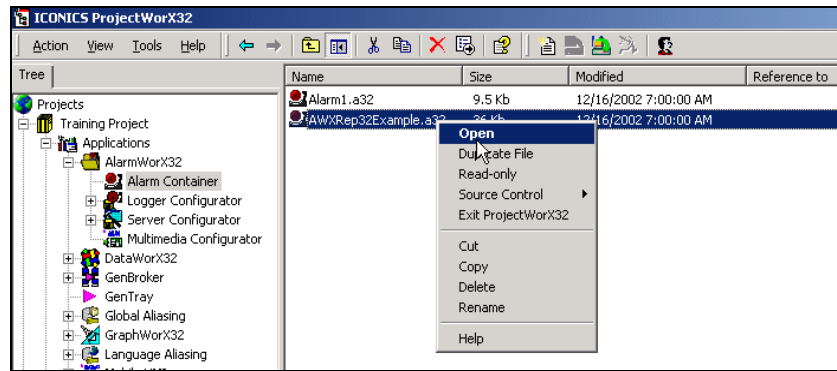


Figure 4.12

NOTE: If you manually copy a file to a project folder in Windows Explorer (i.e. C:\Program Files\ICONICS\GENESIS_32\Projects\Training Project), the next time you open that project in the ProjectWorX32 console ProjectWorX32 will detect the file and ask you whether to import the file into the project. This is shown in **Figure 4.13**. If you click Yes, the file is added to the project tree and is displayed in the right-hand pane of the ProjectWorX32 console. If you click No, the file remains in the project folder but is not imported into the project and is not displayed in the ProjectWorX32 console. However, this does not apply to unpacking_log.txt, packing_log.txt and all .mdb and .udl files.

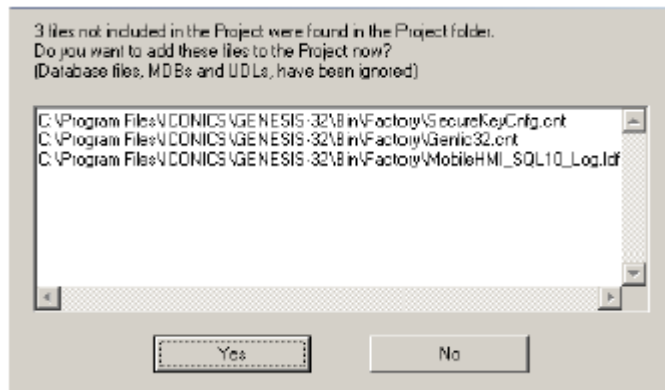


Figure 4.13

4.5.3 Activating Configuration Databases

Some application configurators (e.g. MobileHMI, Alarm Server, Alarm Logger, Alarm Multimedia, and Trend Logger) provide an option to specify an active configuration database.

NOTE: For active Microsoft SQL Server configuration databases, information is stored inside the ProjectWorX32 database and is not subject to continuous polling. If the active configuration is changed from outside ProjectWorX32 (e.g. with the MobileHMI Configurator) you will have to refresh the view by right-clicking and

selecting Refresh from the pop-up menu. This updates ProjectWorX32 with the new database status.

To activate a configuration database:

1. Right-click the configuration database and select **Make Configuration Active** from the pop-up menu.
2. The icon next to the configuration file changes from the standard icon to a globe icon to indicate that it is active.

4.5.4 OPC Tag Verification

The ProjectWorX32 Console includes a feature that lists all of the OPC tags that belong to certain files:

1. For example, right-click a GraphWorX32 display file in the ProjectWorX32 Console and select **List OPC Tags** from the pop-up menu, as shown in **Figure 4.14**.

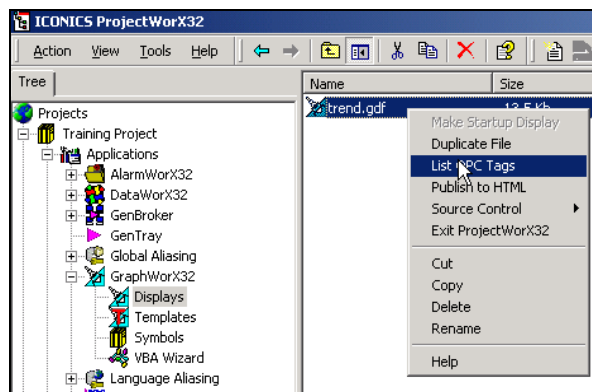


Figure 4.14

2. This opens the **Tag Verification Utility**, which lists all OPC tags contained within the display file. You can verify the status of tags in one of three ways:
 - Double-click a tag under OPC Tag Name.
 - Select one or more tags under OPC Tag Name and click the Verify Selected button.
 - Click the Verify All button to check the status of all tags in the display file.
 - Click Export List to export the data to a text file.
3. Each of the tags selected for verification shows an indicator of good (green), bad (red), or uncertain (yellow) as a form of verification, as shown in **Figure 4.15**.

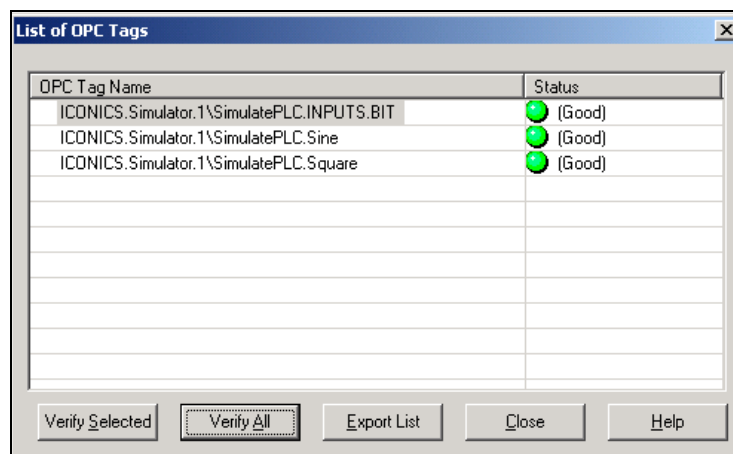


Figure 4.15

4.6 Packing and Unpacking a Project

The pack/unpack projects feature of the ProjectWorX32 console allows you to pack up an entire project (with all included application files) into a single, compressed file. This is especially useful for system administrators who want to configure a project and then send or copy the project to several different computers (e.g. nodes on a network). Then the packed file can be unpacked and run on each computer.

4.6.1 Packing a Project

1. Select a Project, right-click and select **Pack Project**. Also you can select the same option from Action Menu. See **Figure 4.16**:

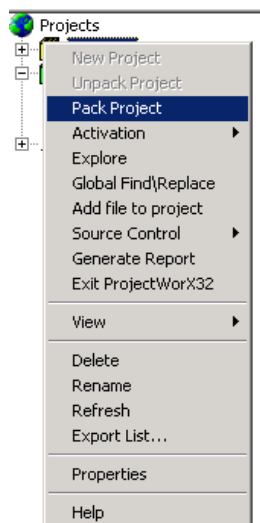


Figure 4.16

2. The **Save Dialog** will open. Choose the location where you would like to save your project.

3. After you specify the location the packing of the project will start. After the packing is over, you will get the message box shown in **Figure 4.17**:

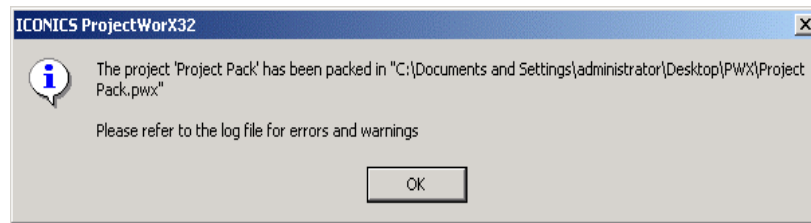


Figure 4.17

4. Select **OK**, and you will see an Internet Explorer page open with the packing information. You will see the date/time when it was packed, with all the files listed. Also if there are any errors while packing you can see them at the end of the page. An example is shown in **Figure 4.18**:

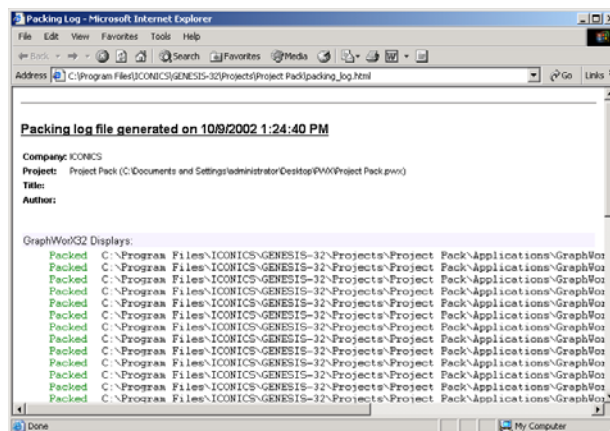
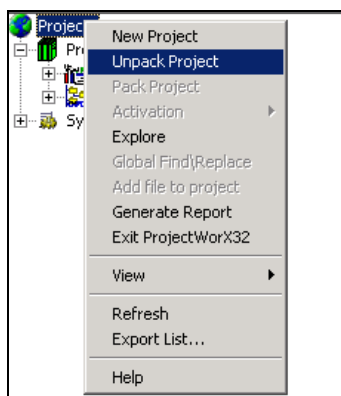


Figure 4.18

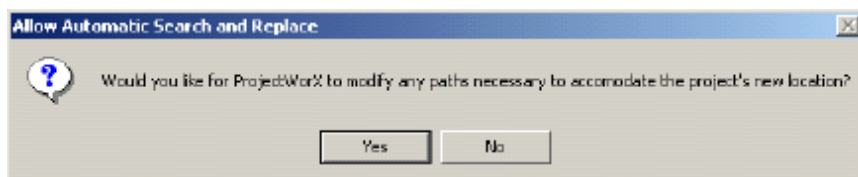
5. Now you can unpack this file on any destination machine by taking this project and copying it to the destination machine.

4.6.2 Unpacking a Project

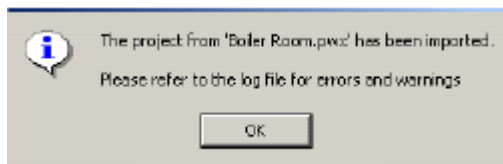
1. Click on the projects to unpack a project. Alternatively you can select the same option from Tools menu. See **Figure 4.19**:

**Figure 4.19**

2. It will prompt you for the location of the file. The file open dialog will open up. Select the file from where you have saved it on your hard disk.
3. You will be asked permission to modify pathways to match the new directory location of the unpacked project. If you click **Yes**, the paths will be changed. If you click **No**, the project will retain its original directory paths.

**Figure 4.20**

4. Once the project has been unpacked, a confirmation message appears, as shown in **Figure 4.21**. Click **OK**.

**Figure 4.21**

5. At the end of unpacking, you will get the same log information in an Internet Explorer page as you did after packing. See **Figure 4.22**:

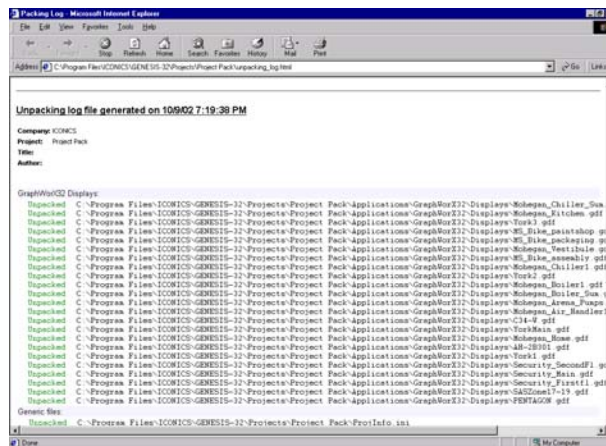


Figure 4.22

6. After you unpack, you can use the **Global Find and Replace** to replace the node name throughout the application. This utility can be launched by selecting the project, right-clicking and selecting **Global Find/Replace**.
7. Now you can make your Project Active, by right clicking on the Project and selecting the option – **Make Project Active**.

4.7 Overwriting Existing Projects

ProjectWorX32 includes a feature that allows you to overwrite an existing project by unpacking a newer version of that project. For example, if a system administrator makes changes to a project and needs to deploy an updated version of the project to multiple users on different network nodes, users on each node can unpack and automatically update the project.

When you unpack a packaged (updated) version of an existing project (a project with the same name) in the ProjectWorX32 Console, ProjectWorX32 scans each file in the updated project. ProjectWorX32 automatically unpacks any new files in the updated project (i.e. files that have been added to the project since the last version).

For packaged files that already exist (i.e. with the same name) inside the project, ProjectWorX32 also checks the date/time of the files. If the date/time of a packaged file is the same as the date/time of the existing file of the same name, nothing happens. If a packaged file is newer (i.e. more recent date/time) than the existing file of the same name, ProjectWorX32 automatically unpacks the newer file and overwrites the existing file. If a packaged file is older than the existing file of the same name, ProjectWorX32 warns you of this fact and gives you the option to overwrite the file.

Note: Difference unpacking of projects will not work for Microsoft SQL Server databases. When unpacking SQL-based configuration files, the files will not be overwritten even if the packed project contains newer files of the same name.

4.8 Activating and Running Projects

The ProjectWorX32 console enables you to create and manage multiple GENESIS32 projects, each of which may contain many different types of application files. Only one project can be put into runtime mode at a time. In order to enter a project into runtime mode, you must first designate the project as the currently active project. When you make a project active in the ProjectWorX32 console, all the connected included databases that are active for the project and all the settings to properly set up the GenTray are "made active" on the current machine. If there are multiple configuration databases for a single application within the active project, only the active database for that application will enter runtime mode.

4.8.1 Making a Project Active

To make a project active in the ProjectWorX32 console:

1. Right-click the project in the tree control and select **Activation→Make Project Active** from the pop-up menu, as shown in **Figure 4.23**.

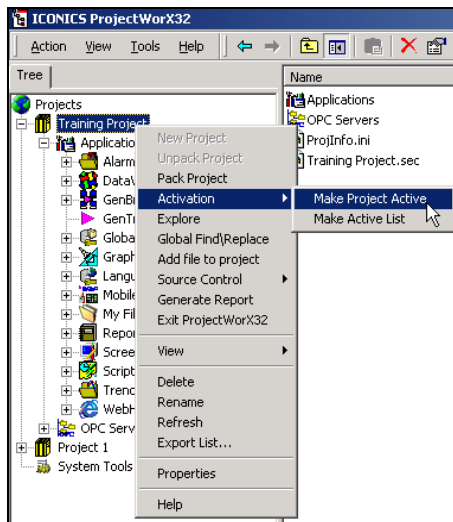
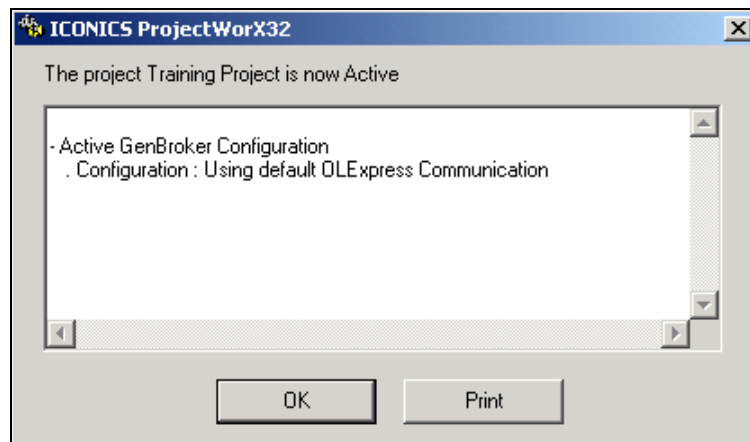


Figure 4.23

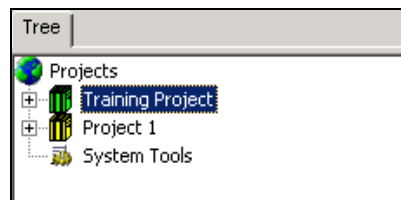
2. A dialog box appears confirming that the project is now active, as shown in **Figure 4.24**. This dialog box provides a final report after activating the project. Click **OK**.

NOTE: You can also view the activation report at any time by choosing select **Activation→Make Active List** from the pop-up menu, as shown in the **Figure 4.23**. Click **Print** if you want to print out the activation report.

**Figure 4.24**

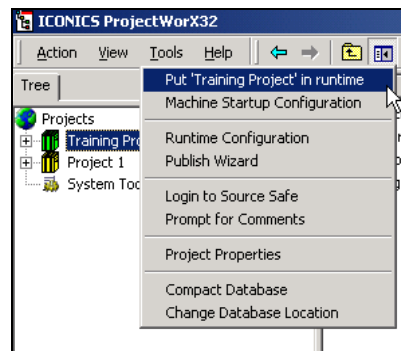
3. The icon for the project is now green to indicate that it is the currently active project, as shown in **Figure 4.25**.

NOTE: Activating a project does NOT set the active project into runtime mode.

**Figure 4.25**

4.8.2 Starting the Active Project

Once you have activated a project, you can enter the entire project into runtime by selecting **Put [Project Name] in Runtime** from the **Tools** menu, as shown in **Figure 4.26**. The name of the currently active project appears in the Tools menu command (in our case **Training Project**).

**Figure 4.26**

4.8.3 Stopping the Active Project

To take the active project out of runtime mode, select **Shut Down [Project Name]** from the **Tools** menu, as shown in **Figure 4.27**. The name of the currently running, active project appears in the Tools menu command (in our case **Training Project**).

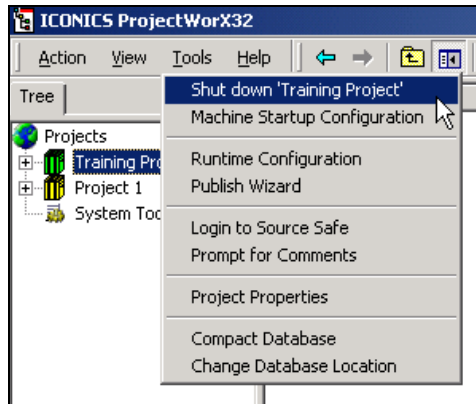


Figure 4.27

Getting Started with GraphWorX32 5

5.1 Introduction to GraphWorX32

GraphWorX32 is an advanced HMI (Human Machine Interface) piece of software, and is a fully functional OPC Client application. It utilizes Microsoft's powerful ActiveX technology and communicates via COM/DCOM with OPC Servers and other applications. It also provides user programmability through industry standard Microsoft VBA (Visual Basic for Applications).

GraphWorX32 is a virtual container for ICONICS' suite of ActiveX controls as well as those from third parties. It is now easier than ever to view and control the process with GraphWorX32. It supports highly detailed displays and incredible animation effects.

A rich set of drawing tools is available to create display objects. Objects may also be copied from other Windows applications such as bitmaps and metafiles, or converted from GENESIS and GFW graphics. Embedded ActiveX controls allow other GENESIS32 applications, such as TrendWorX32 and AlarmWorX32, to be embedded within the GraphWorX32 displays.

5.2 Objectives

This chapter is intended to be an introduction to the GraphWorX32 tools and how to connect points from an OPC server to the OPC client GraphWorX32.

After completing this chapter you should be familiar with:

- Configuring the GraphWorX32 display properties
- Using the Symbols Directory
- Connecting points from OPC server applications to GraphWorX32 to make display objects dynamic
- Configuring dynamic actions such as the Size action, Analog Color, Process Point etc.
- Using local aliasing within GraphWorX32
- The use and functionality of the different tools of GraphWorX32

5.3 GraphWorX32 Basics Exercise Overview

This exercise will consist of three displays. The first display will be a map of the US Airlines Network, with an Active Link to Logan Airport, shown in **Figure 5.1**. The circle located over the Boston area (Logan Airport) flashes on a regular basis.



Figure 5.1

When the flashing circle located over Logan Airport is clicked, our main display opens, which is shown in **Figure 5.2**. This display has several layers, one for each terminal (A–E). When the terminal letter is clicked upon, the airlines associated with that terminal are listed on the display. The temperature in that terminal is also displayed.

**Figure 5.2**

Finally, if the parking symbol in the middle of screen is clicked upon, a popup menu opens, with four menu items: one for each of the four parking levels. This is shown in **Figure 5.3**.

**Figure 5.3**

Clicking on any of the four menu items will open up a popup window, showing the status of that parking level (available or full). This final screen is shown in **Figure 5.4**.

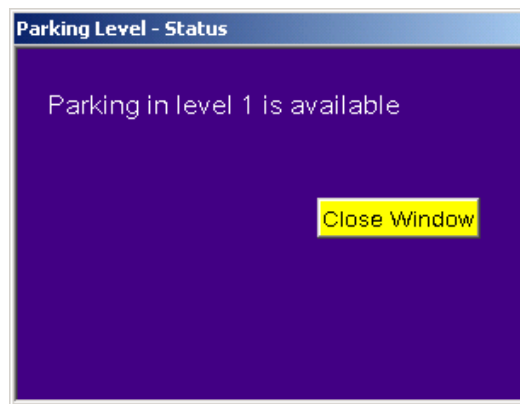


Figure 5.4

5.4 Creating the Main Display

Begin by launching the GraphWorX32 application from within ProjectWorX32.

1. Open ProjectWorX32 from **Start→Programs→ICONICS GENESIS-32→ProjectWorX32**.
2. In the tree control, expand **Projects→Training Project→Applications→GraphWorX32→Displays**.
3. Right click on **Displays** in the tree control and select **New Display**, and name the display **Logan_Airport.gdf**, as shown in **Figure 5.5**. Click **Ok**.

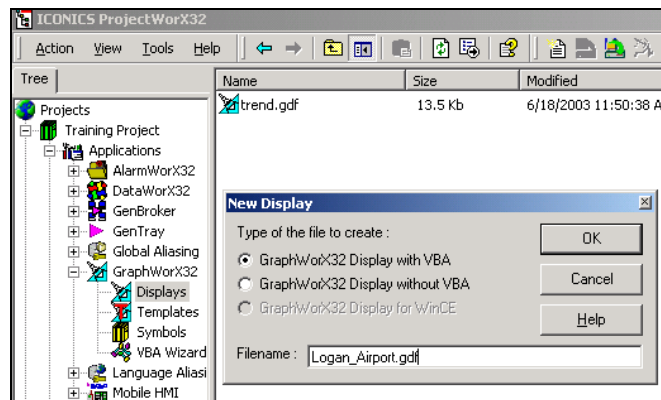


Figure 5.5

4. Your new display will automatically open, and be ready for you to edit. It will also be listed in the **Displays** section of project.

5.4.1 Configuring Display Properties

1. Right-click any where on the workspace of the new display and select **Display Properties**

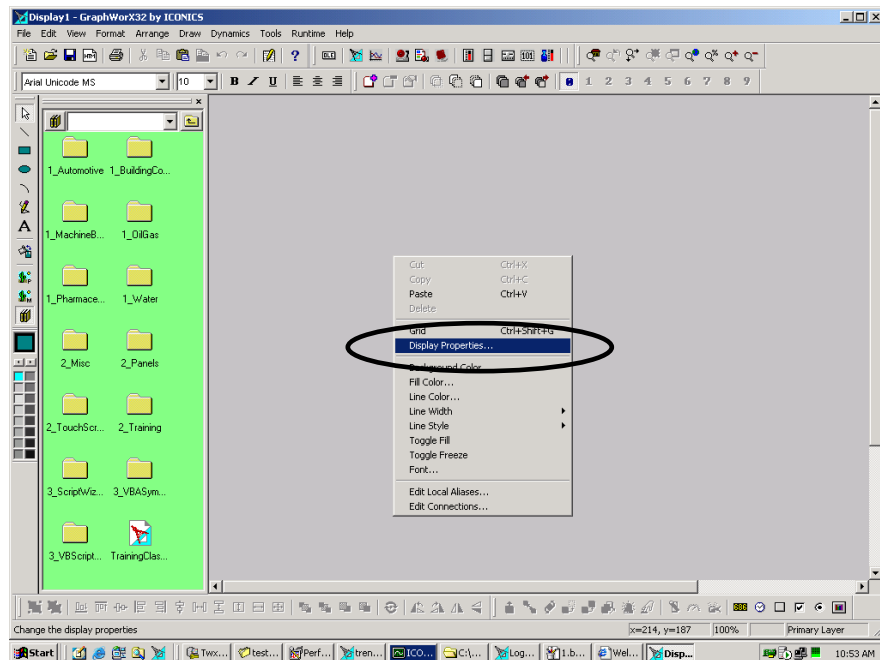


Figure 5.6

2. Here on the **General** tab we will set our background color, also look at the tab and make sure that all other settings are the same as shown in **Figure 5.7**.

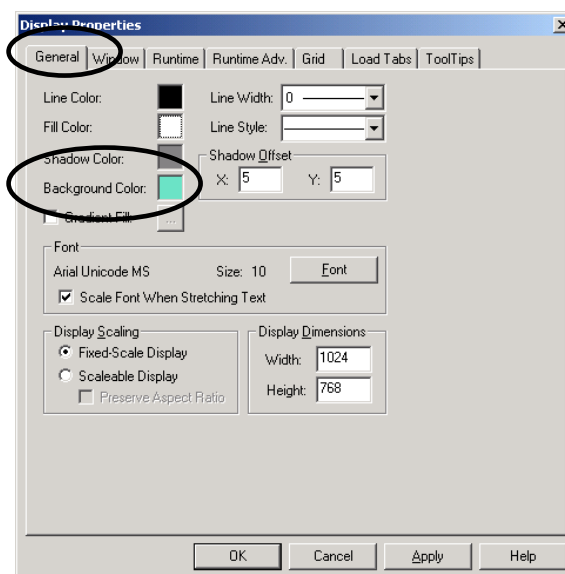


Figure 5.7

- Now on the **Grid** tab, select **Show Grid** and set both the **Width** and **Height** to **10**. Again, make sure that everything else is the same as shown in **Figure 5.8**.

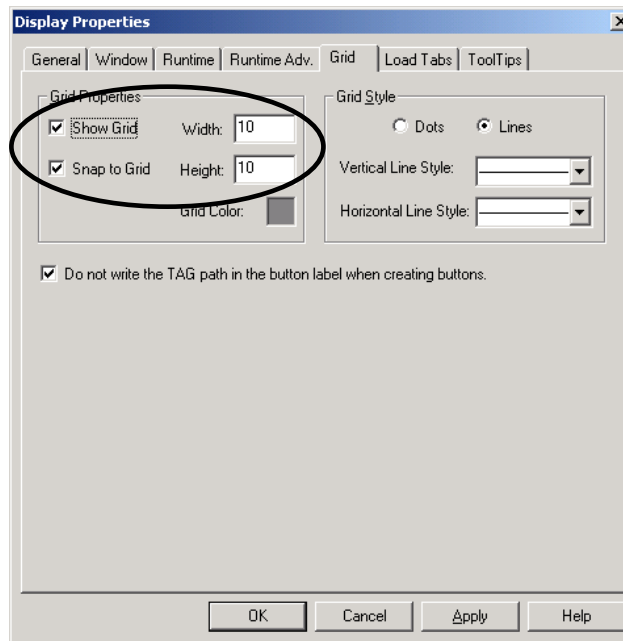


Figure 5.8

- On the **Windows** tab set the window dimensions and other properties as shown in **Figure 5.9**.

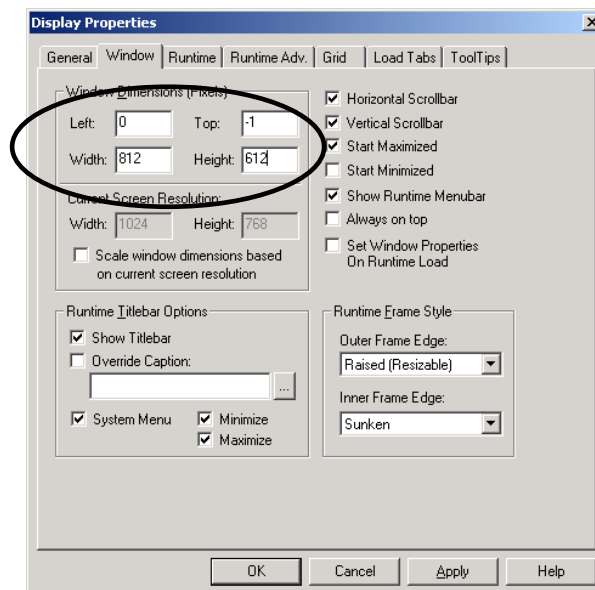


Figure 5.9

5.4.2 Formatting using the Draw and Arrange Toolbars

1. We will start by putting a rectangle close to the top of the display so that it looks like **Figure 5.10**. To create a rectangle you can either use the  button on the **Draw** toolbar, or go to select **Rectangle/Square** from the **Draw** menu. Once the rectangle has been created, right-click and select **Fill Color**. A color palate will appear from which you can select a dark shade of green.

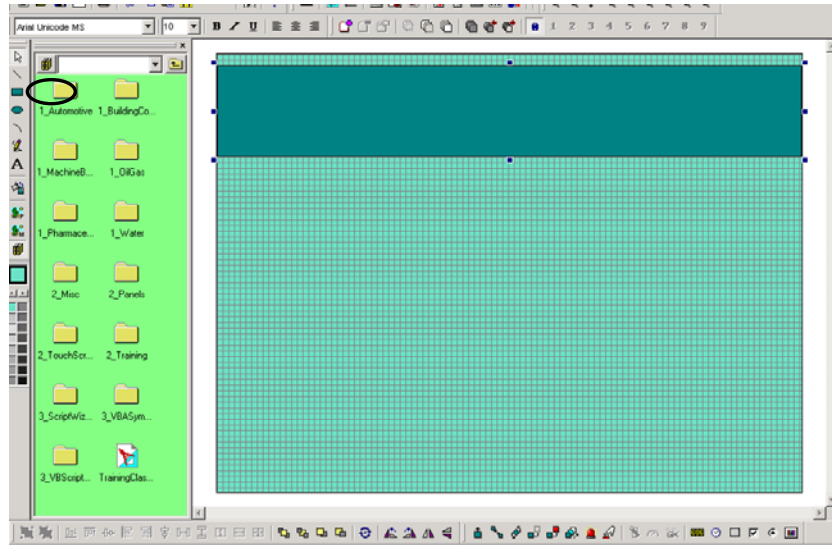


Figure 5.10

2. Now add a text box on top of the newly created rectangle by clicking on the  button on the **Draw** toolbar, or by selecting **Text** from the **Draw** menu. Type **Logan Airport Terminals & Parking Garage** in the text box.
3. Double click the text you just created to open the property inspector of that text field, shown in **Figure 5.11**. Click the **Font...** button and select 32 as the size of the text, then click **Ok**. Now **Apply** these settings and click **Ok**.

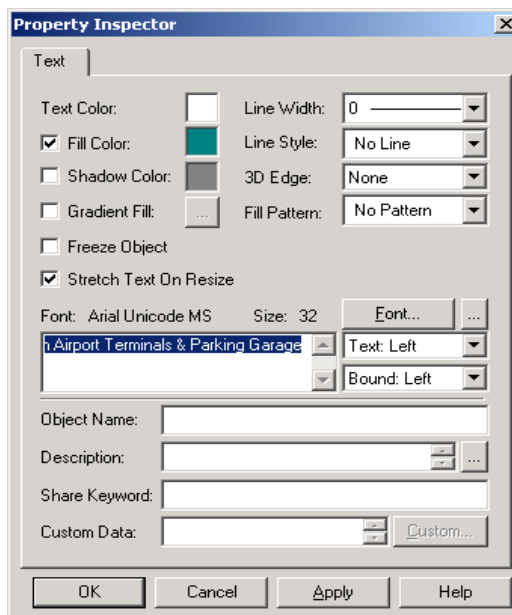


Figure 5.11

4. Back on the GraphWorX32 display select both the text and the rectangle by holding down the **Shift** button while selecting, we are going to group the two objects together so they will act as a **Symbol**. After selecting both objects click the  button located on the **Arrange** toolbar to group them into a symbol. This symbol should look like **Figure 5.12**.

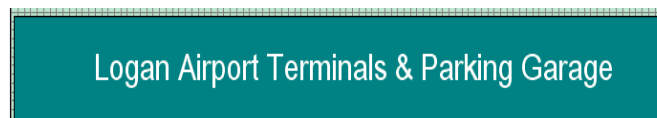


Figure 5.12

5. We will add another text field just below the rectangle symbol. As we did before, click the  button and type **Temperature in Terminal**, as shown in **Figure 5.13**. This will be our label for the temperature reading of the terminal.



Figure 5.13

5.4.3 Connecting to OPC Data via Process Points

The **Process Point/Data Entry (PPT/DE)** function creates an object used to display and enter data in an alphanumeric format.

A **Process Point** is an object that displays the real-time value of a connected data point during runtime mode. This value is updated when the server notifies GraphWorX32 of a change in the data-point value.

A **Data Entry** behaves the same way as a process point does, but a data entry also allows you to manually enter new values to be downloaded to the system.

To create a process point/data entry (PPT/DE) object:

1. Directly next to the **Temperature in Terminal** text box, insert a **Process Point**.

To do this, click on the  button on the **Dynamics** Toolbar, or select **Intrinsics→Process Point** from the **Dynamics** menu. Click inside the display to place the item.

2. The **Properties Inspector** will appear. This is where you define the OPC tag, or expression representing an OPC tag, the process point will be connected to. The **OPC Tags** button opens the **Universal Tag Browser** where you can directly browse to and select an OPC tag to connect to. In this example, however, we will create an expression containing an OPC tag.
3. To write the expression click **Tags Menu→Expression Editor**, as shown in **Figure 5.14**.

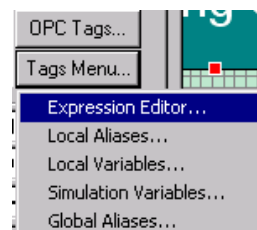


Figure 5.14

4. This will bring up the expression editor. Within the expression editor we will create the following expression in steps 4 - 7:

```
x= if(~~Terminal~~=1,50, if(~~Terminal~~=2 || ~~Terminal~~=3 ||  
~~Terminal~~=4 || ~~Terminal~~=5,65,0) )
```

5. We will first click on the **Functions** button and select **if**, as shown in **Figure 5.15**.

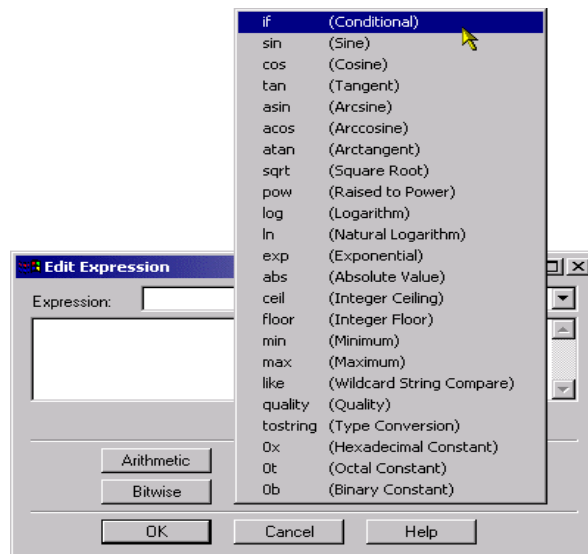


Figure 5.15

- 6 Just after the first parenthesis we will write **Terminal**. Leave the cursor where it is and select **Equal To** from the **Relational** menu and enter the number 1.

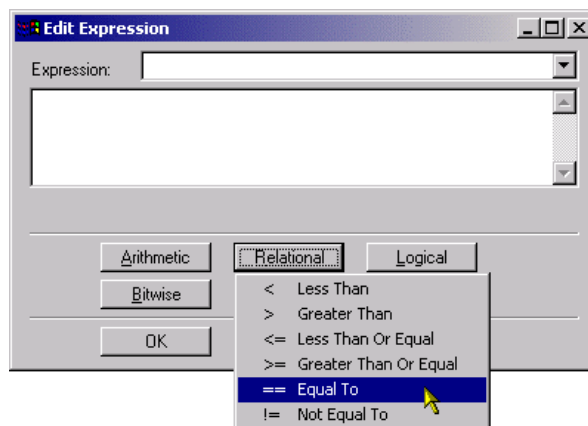


Figure 5.16

- 7 Using the **Function** and **Relational** buttons as in steps 4 – 5, enter the remainder of the function so the final function is the following:

```
if(Terminal==1,50, if(Terminal==2 || Terminal==3 ||
Terminal==4 || Terminal==5,65,0) )
```

The Expression Editor will look like **Figure 5.17** when you are done.

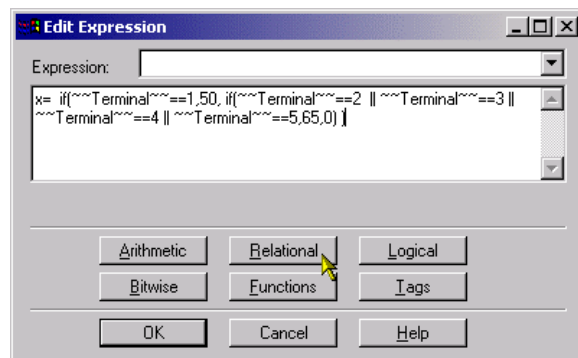


Figure 5.17

- 8 Now click **Ok** in the **Expression Editor** to return to the **Properties Inspector**. Select **Apply** and **Ok**.

5.4.4 Using the Symbols Library

Now we will insert a diagram of the Logan Airport Terminals, which is contained within the **Iconics Symbol Library**.

You can use the Symbol Library to create and edit graphic objects as symbols and to build and maintain symbol categories. A symbol is a group of objects that is treated as a single object. These symbols can be user-created or loaded from the symbol library categories delivered with GraphWorX32.

1. We must first make sure that the **Symbols** toolbar is visible by selecting **Toolbars** from the **View** menu, and checking **Symbols**.
2. To find the Logan Airport image browse to **Training→Training Class V7.sdf** in the dropbox located at the top of the **Symbols** toolbar, as shown in **Figure 5.18**.

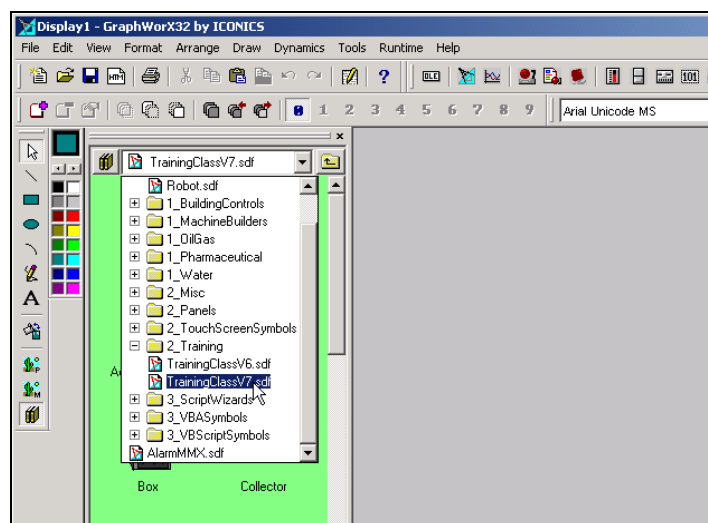


Figure 5.18

- From the **Symbols Library**, drag and drop the **Logan** image onto the GraphWorX32 workspace so that it looks like **Figure 5.19**.

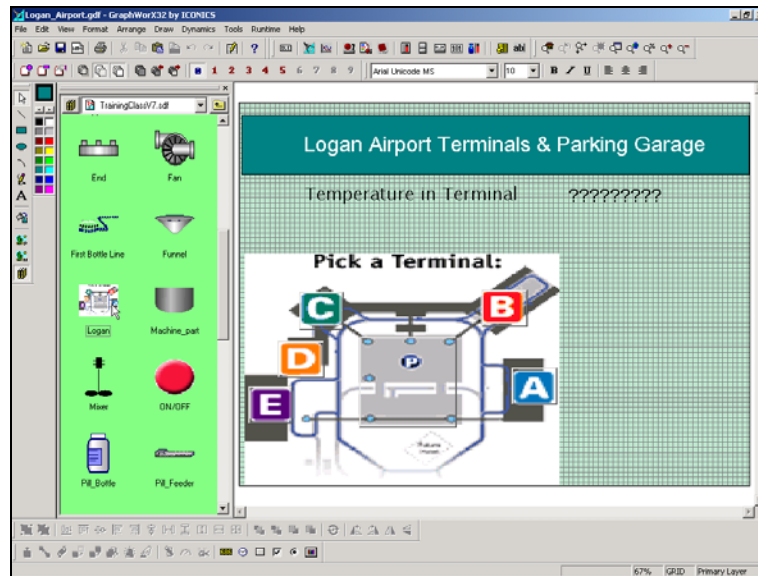


Figure 5.19

5.4.5 Using Layers

The use of layers in GraphWorX32 is helpful because it allows you to categorize elements of the display and separate it into levels of detail through decluttering. Using the Layers command in the Format menu, you can add, remove, or duplicate a layer. You can also edit the layer properties, set the active layer, set the next layer, set the previous layer, hide layers above the current layer and hide layers below the current layer.

- Now we will add a new later to this display. Select **Layer→Add Layer** from the **Format** menu, as shown in **Figure 5.20**.

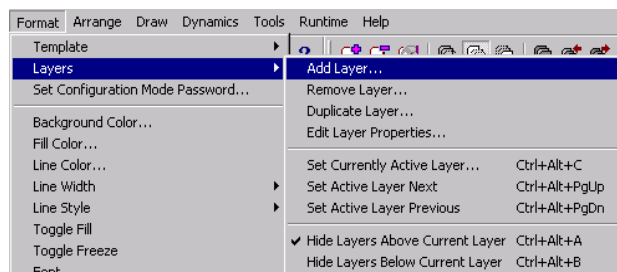


Figure 5.20

- In the **Edit Layer Properties** window, enter **Terminal A** for the **Layer Name**. Where it says **Hide Layer When Data Source is False (zero)**, click on the **Tags Menu** button and select **Expression Editor**.

- 3 In the expression editor type **~~Terminal~~**, then select the **Relational** button and select **=** and type the number 1. Click **Ok**; the expression should look like the following:

~~Terminal~~ = 1

- 4 The **Edit Layer Properties** window should now look like **Figure 5.21**.

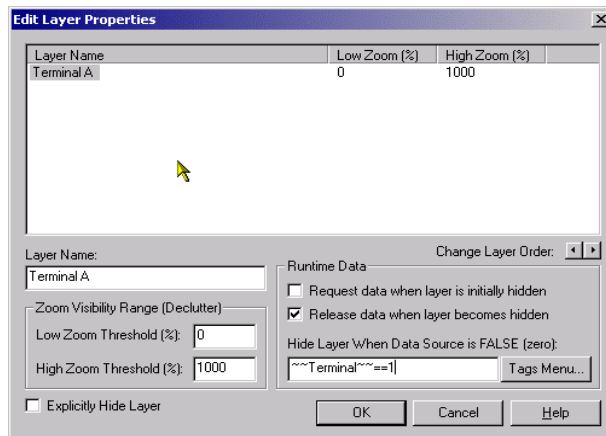


Figure 5.21

- 5 Follow the same procedure to create four more layers: **Terminal B** through **Terminal E**. When complete, the **Edit Layer Properties** window should look like **Figure 5.22**. Click **Ok**.

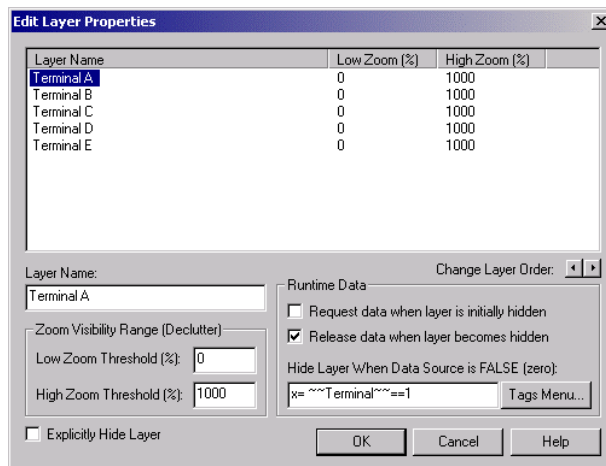


Figure 5.22

- 6 We will first display **Layer 1**, which will represent **Terminal A**. To switch layers select the number on the **Layers** toolbar as shown in **Figure 5.23**.

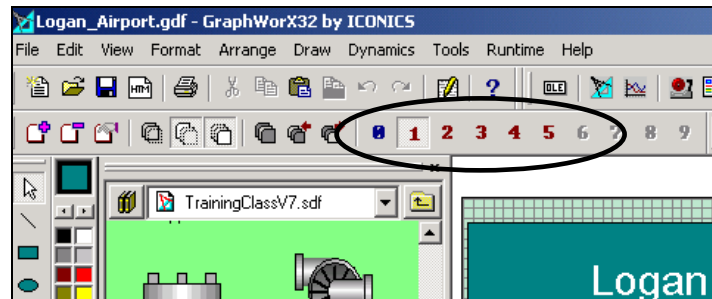


Figure 5.23

NOTE: Items on the **Primary Layer** (layer 0 on the toolbar) are displayed no matter what layer is active. Layers other than the active layer can be hidden for better

visibility using the **Hide Layers** buttons  on the **Layers** toolbar.

- 7 On **Layer 1** we will add a text field that lists the airlines that fly out of **Terminal A**. To do this, select the text icon  from the **Draw** toolbar. To the left of the terminal picture place the text field and type **AIRLINES IN TERMINAL A**. After typing this, double-click on the text to bring up the **Properties Inspector** to change to **Font Size** to **42**, as shown in **Figure 5.24**.

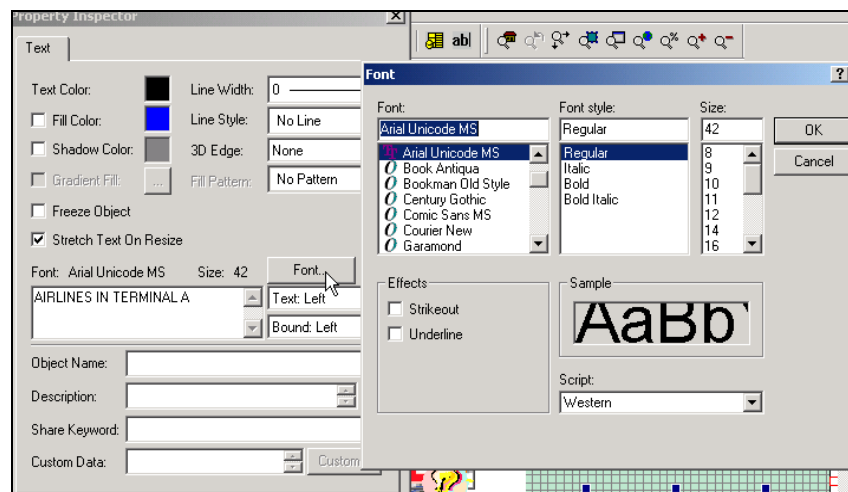


Figure 5.24

- 8 Just below the text that was just entered we will put an indicator light to indicate that Terminal A is having renovations done so it is not open. In the **Symbols Library**, go into the **Misc→Animated Gif** directory and select the **Attention** symbol and drag it just below the **AIRLINES IN TERMINAL A** label.

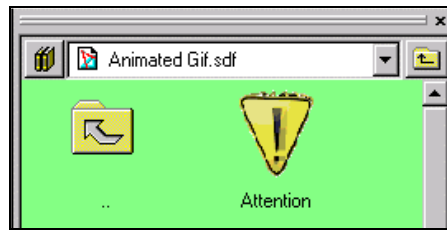


Figure 5.25

- 9 Finally just below the attention symbol you will add a text field: **CLOSED FOR RENOVATION**.
- 10 Select the two text fields that you have created, as well as the attention symbol while holding the shift key. Group these items together by clicking on the  button on the **Arrange** toolbar. Layer 1 should now look like Figure 5.26.

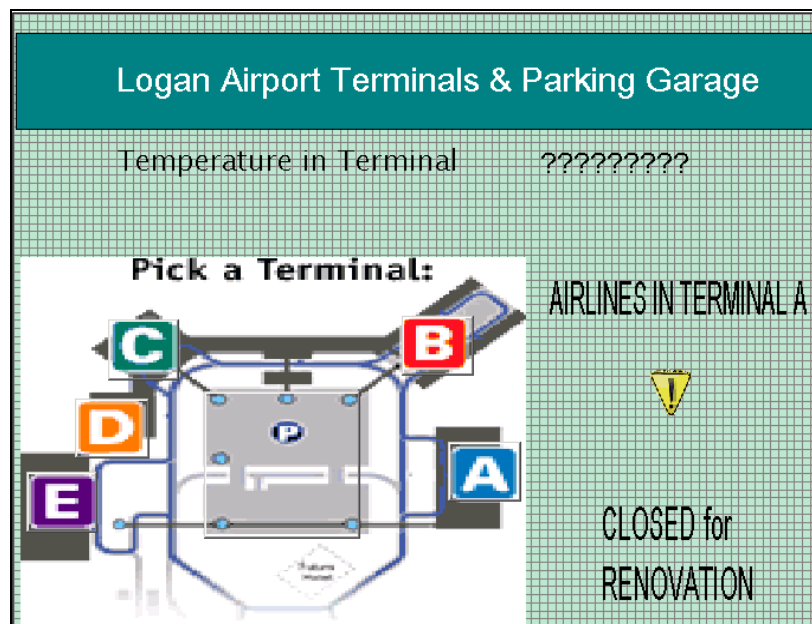


Figure 5.26

- 11 Next we will work on **Layer 2**, which will be for **Terminal B**. Switch to Layer 2 by selecting the number on the **Layers** toolbar as we did in step 6.
- 12 In the same location that you wrote AIRLINES IN TERMINAL A, write **AIRLINES IN TERMINAL B**. Just below this label, we will list all the airlines that use that terminal. To do this, add another text field and place it just below the terminal label. We will list the following airlines:
 - 1) Alaska Airlines
 - 2) America West
 - 3) American
 - 4) American Eagle
 - 5) American TransAir

- 6) Delta Shuttle
 - 7) Frontier
 - 8) Qantas
 - 9) US Airways
 - 10) US Airways Shuttle
 - 11) US Airways Express
- 13 We will need to change the font size of the list of airlines. Double-click the text box of the airlines and in the **Properties Inspector** click the **Font** button. Change the **Font Size** to **16**.
 - 14 Group these two text fields just as you did for Layer 1 in step 10. **Layer 2** should look like **Figure 5.27** when you are finished.

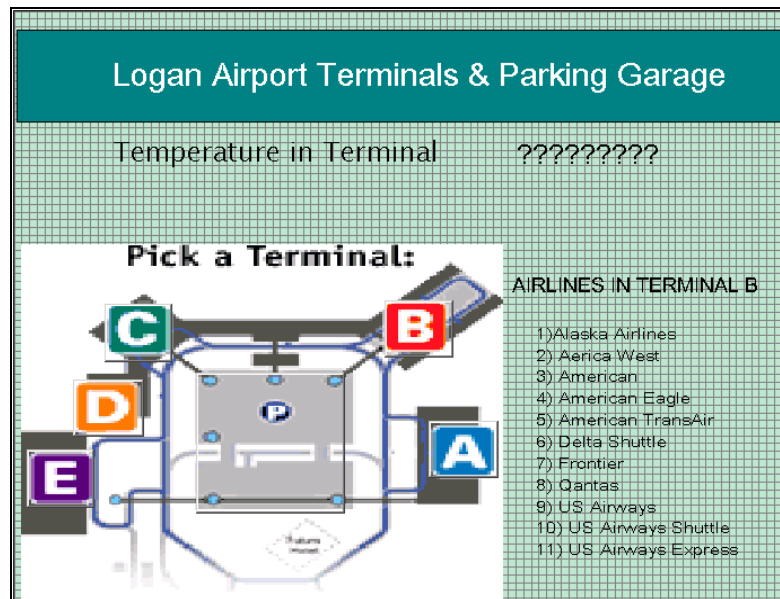


Figure 5.27

- 15 Next we will work on **Layer 3** which will be for **Terminal C**. Switch to Layer 3 using the appropriate button as in step 6.
- 16 Add a terminal label that reads **AIRLINES IN TERMINAL C** with the list of airlines associated with Terminal C just as you did in step 12. The list of airlines is as follows:
 - 1) Air France
 - 2) Air Jamaica
 - 3) Cape Air
 - 4) Continental
 - 5) Delta Airlines
 - 6) Delta Express
 - 7) Midwest Express
 - 8) Swiss
 - 9) United

- 17 Group these text fields just like you did in step 10. **Layer 3** should look like **Figure 5.28** when complete.

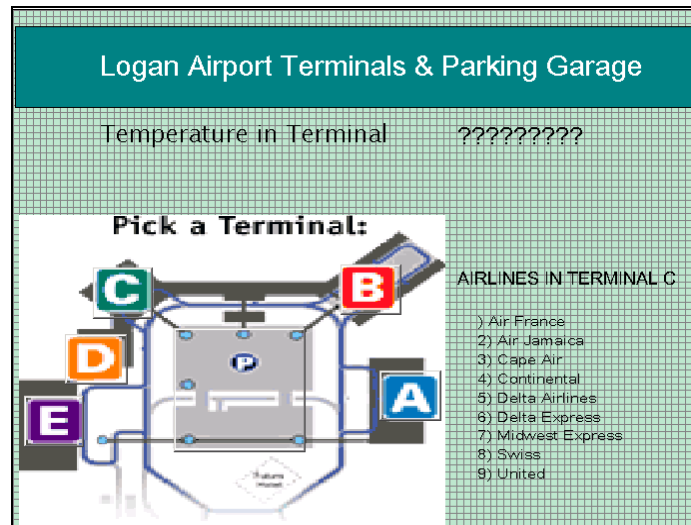


Figure 5.28

- 18 Now we will complete **Layer 4** for **Terminal D**. Switch to Layer 4 using the appropriate button as in step 6.
- 19 Just as you did in step 12, create a terminal label that reads **AIRLINES IN TERMINAL D**, with a list of associated airlines below the label. The airline list is as follows:
- 1) Air Tran
 - 2) Alitalia
 - 3) Charters
- 20 Group these text fields just like you did in step 10. **Layer 4** should look like **Figure 5.29** when complete.

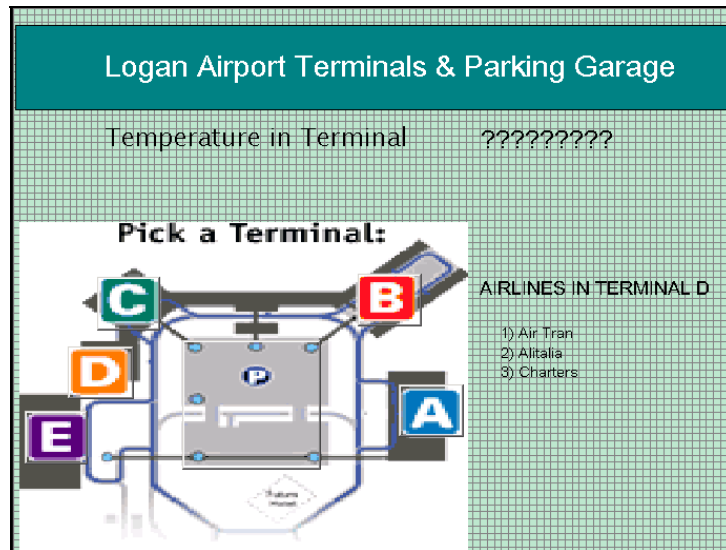


Figure 5.29

- 21 Finally we will complete **Layer 5** for **Terminal E**. Switch to Layer 5 using the appropriate button as in step 6.
- 22 Just as you did in step 12, create a terminal label that reads **AIRLINES IN TERMINAL E**, with a list of associated airlines below the label. The airline list is as follows:
 - 1) Aer Lingus
 - 2) Air Canada
 - 3) Air France (Int'l arrivals only)
 - 4) Air Jamaica (Int'l arrivals only)
 - 5) Alitalia
 - 6) American (Int'l arrivals only)
 - 7) British Airways
 - 8) Delta (Int'l arrivals only)
 - 9) Icelandair
 - 10) KLM
 - 11) Lufthansa
 - 12) Northwest
 - 13) Swiss (Int'l arrivals only)
 - 14) United (Int'l arrivals only)
 - 15) VG Airlines
 - 16) Virgin Atlantic
- 23 Group these text fields just like you did in step 10. **Layer 5** should look like **Figure 5.30** when complete.



Figure 5.30

24 Now let us return to the **Primary Layer** to do this select the 0 on the **Layers** toolbar.

5.4.6 Pick Actions, Local Variables, and Local Aliases

On the **Primary Layer** we will add buttons that will allow us to switch between the different layers in runtime. To do this we will use **Pick Actions**, **Local Variables**, and **Local Aliases**.

The **Pick Action** function allows you to configure an object such that it performs an action when the object is clicked during runtime mode. Such actions include loading displays, popping up windows, launching applications, and downloading values.

Local Variables can be used in expressions and data sources locally. How the variable needs to be referred to depends on the type of variable. A local variable can be used in expressions when the variable is embedded between double tildes: `~~local_variable_name~~`. The use of local variables can make the development of pages quicker and makes modification of pages centralized.

A **Local Alias** is a string that represents or describes an object or data point in a display that can be used in expressions locally. For local aliases within the expression, use the following syntax: `<<local_alias_name>>`.

1. To insert a button either click on the  button located on the **Dynamics** toolbar, or select **Intrinsics**→**Pushbutton** from the **Dynamics** menu.
2. Position this first button over the blue letter **A** on the **Logan** symbol. Once it has been positioned it will cover the **A**, but we will change that.

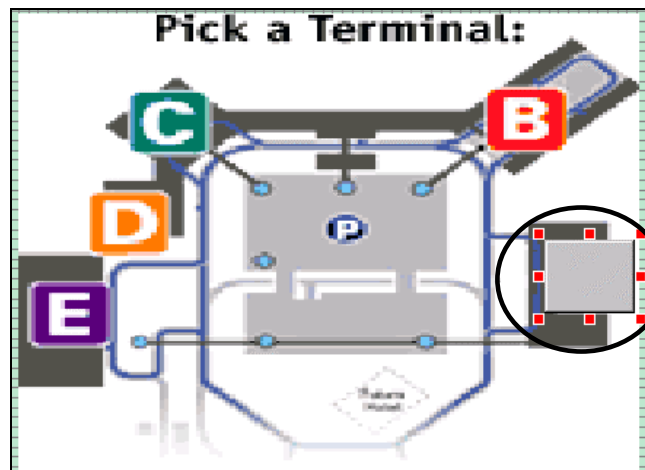


Figure 5.31

- Double-click on the button to bring up the **Properties Inspector**. Configure the button's properties as shown in **Figure 5.32-33**. Note that there is **NO Fill Color** selected so that the letter A is visible through the button.

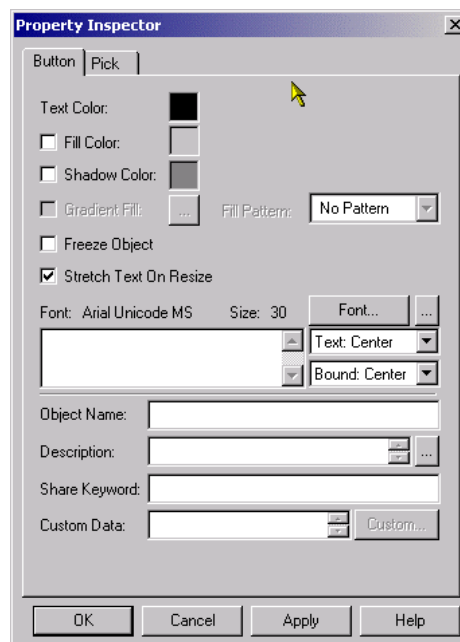
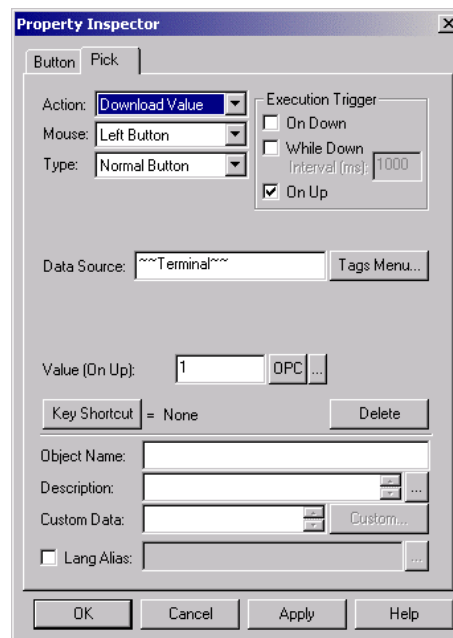


Figure 5.32

- We will choose a **Pick Action** of **Download Value**. Note that we are using a local variable **Terminal** for the **Data Source**. When this button is clicked, the local variable **Terminal** will be given the value **1**.

**Figure 5.33**

5. Create another button and position it over the red letter **B**. Once it has been positioned, double-click on it to bring up the **Properties Inspector**, and configure the properties as you did for the first button in step 3. Rather than **Value (On Up)** being equal to 1, make it equal to 2.
6. Create another button and position it over the red letter **C**. Once it has been positioned, double-click on it to bring up the **Properties Inspector**, and configure the properties as you did for the first button in step 3. Make **Value (On Up)** equal to 3.
7. Create another button and position it over the red letter **D**. Once it has been positioned, double-click on it to bring up the **Properties Inspector**, and configure the properties as you did for the first button in step 3. Make **Value (On Up)** equal to 4.
8. Create another button and position it over the red letter **E**. Once it has been positioned, double-click on it to bring up the **Properties Inspector**, and configure the properties as you did for the first button in step 3. Make **Value (On Up)** equal to 5.
9. Create another button and position it over the blue letter **P** for the parking area. Once it has been positioned, double-click on the button to bring up the **Properties Inspector**. Configure its properties as shown in **Figures 5.34-35**.

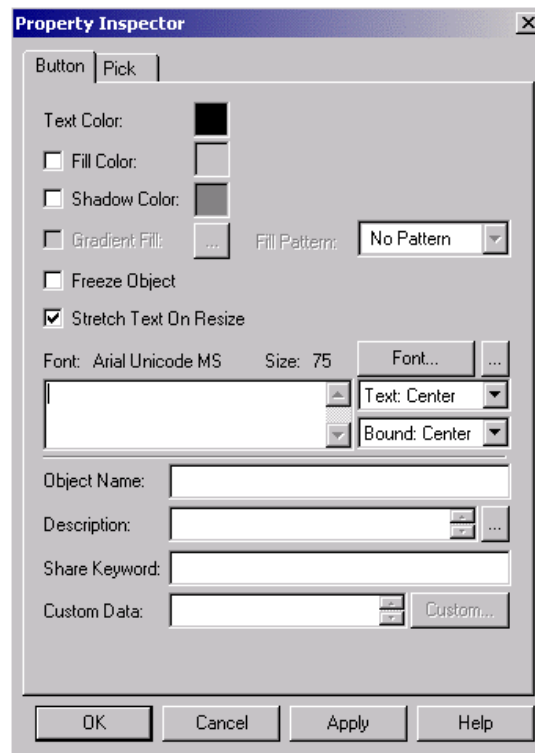


Figure 5.34

10. For this button, we will choose a **Pick Action** of **Popup Menu**. When this button is clicked, a list of **Menu Items** will appear that will each have their own Pick Actions.

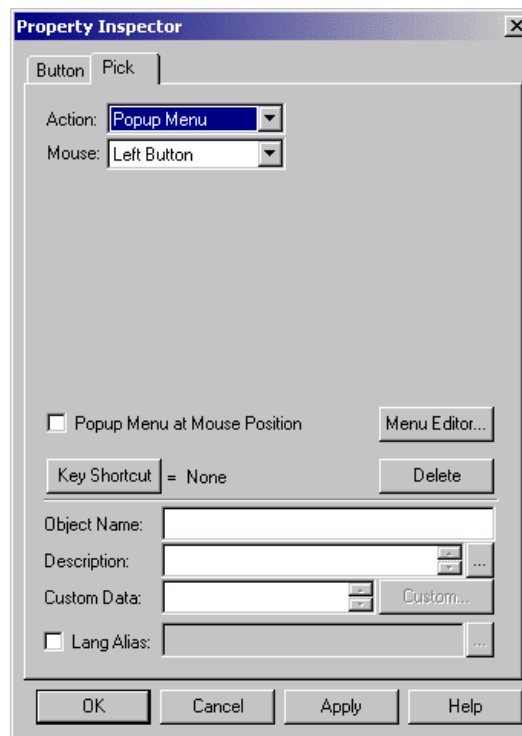


Figure 5.35

11. It is necessary to select the **Menu Editor** button so that we can setup our **Menu Items**. First select **Add Item** and type **Parking Status** as shown in Figure 5.36.

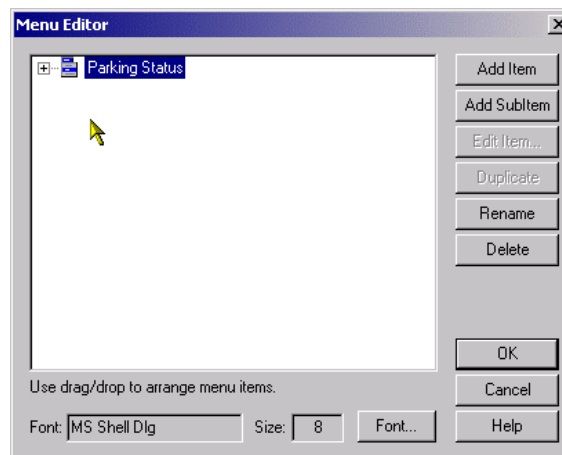


Figure 5.36

12. Now select **Add SubItem** and type **Level 1**. Add three more levels in the same way for **Levels 2-4**. The **Menu Editor** window will look like Figure 5.37.

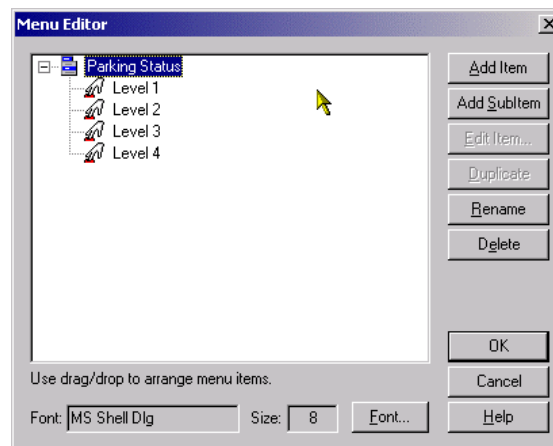


Figure 5.37

13. Select **Level 1** and click **Edit Item**; another Property Inspector will appear. This Menu Item will have a **Pick Action** of **Popup Window**. Type **ParkLevel.gdf** as the filename, which is the next display that we will create. When this Menu Item is selected from the Popup Menu, the Popup Window ParkLevel.gdf will be loaded.

NOTE: The entire path name of the file is not necessary if and ONLY IF the file is located in the same directory as the main display that links to it. In this example we are saving all the files in the same directory, which is done automatically through ProjectWorX32.

14. In the **Property Inspector**, select the **Set Aliases** button then **Local Aliases**. For the **Alias name** enter **level**, and set the **Alias Definition** to be **1**. Click add and verify that the setup is as shown in **Figure 5.38**. Click **Ok** to close the **Local Aliases Configuration**, and again to close the Menu Item **Property Inspector**.

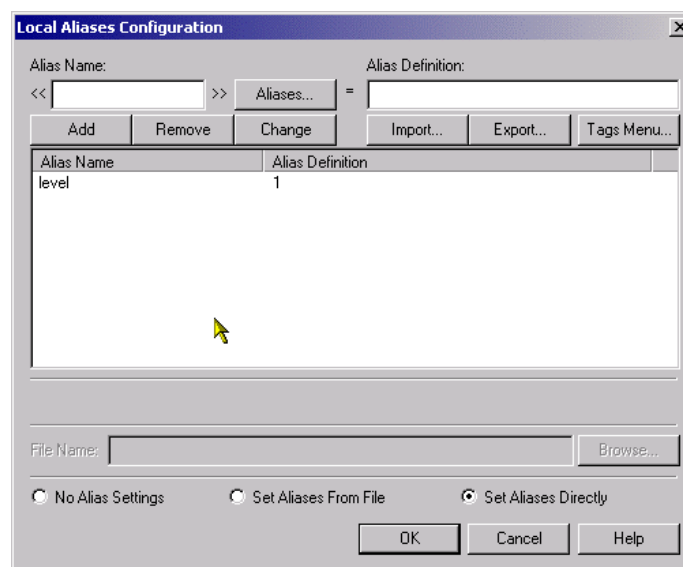


Figure 5.38

15. In the **Menu Editor**, select **Level 2** and click **Edit Item**. Configure this Menu Item's properties as you did for **Level 1** in step 13.
16. Now select the **Set Aliases** button then **Local Aliases**. For the **Alias name** enter **level** and set the **Alias Definition** to be **2**. Click add and verify that the setup is as shown in **Figure 5.39**. Click **Ok** to close the **Local Aliases Configuration**, and again to close the Menu Item **Property Inspector**.

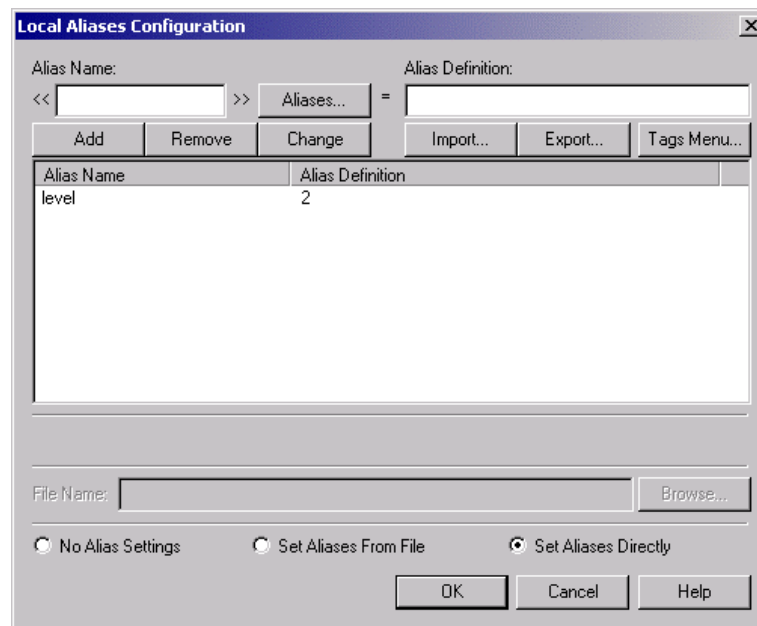


Figure 5.39

17. Configure the **Level 3** and **Level 4** Menu Items in the same way you did **Level 1** and **Level 2**, making sure that the **Alias Definitions** are **3** and **4** respectively.
18. Save this main display now, as it is complete.

5.5 Creating the Popup Window Display

We will begin by opening a new display, which we will use to create the Popup Window **ParkLevel.gdf** that we referred to in our Popup Menu Items. This will simply be a small window that will pop up with the availability status of the parking level selected.

1. In ProjectWorX32, right click on **Displays** in **Projects→Training Project→Applications→GraphWorX32** and select **New Display**, just as you did to create **Logan_Airport.gdf**.
2. Name the new display **ParkLevel.gdf** and click **Ok**. Note that ProjectWorX32 automatically will save this display in the same directory as **Logan_Airport.gdf**, making referencing between files for Pick Actions simple.

3. The first thing we need to do is to setup the **Display Properties**. Right-click anywhere on the GraphWorX32 display and select **Display Properties** as shown in **Figure 5.40**.

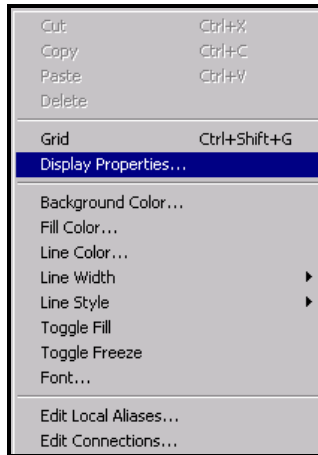


Figure 5.40

4. On the **General** tab set the parameters as shown in **Figure 5.41**. These configurations deal with the appearance of the display. Since this display will be a popup window, an important feature is the **Display Scaling**. By selecting the **Fixed Scale Display**, the window will be the size specified in the **Display Dimensions** section, and will not be scalable by the user while in Runtime.

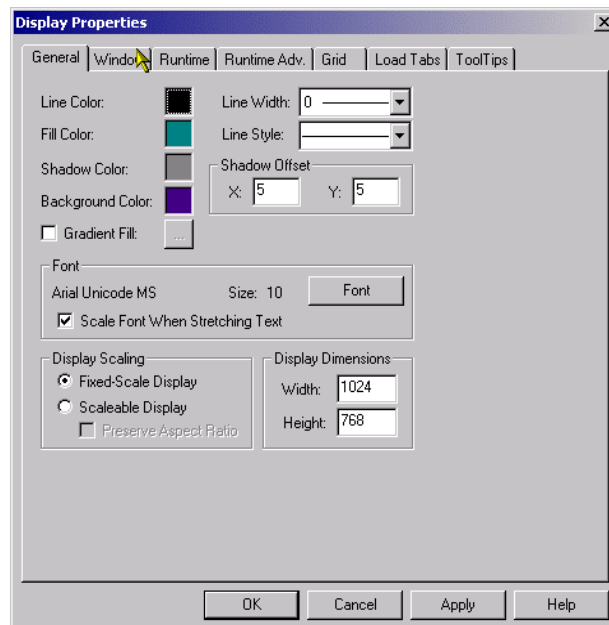


Figure 5.41

5. You should also configure the **Window** tab so that its configuration looks like **Figure 5.42**. Since this is a popup window, the scrollbars do not need to be displayed, and we do not want to show the Runtime Menubar. We will also create a caption to be displayed here: **Parking Level – Status**.

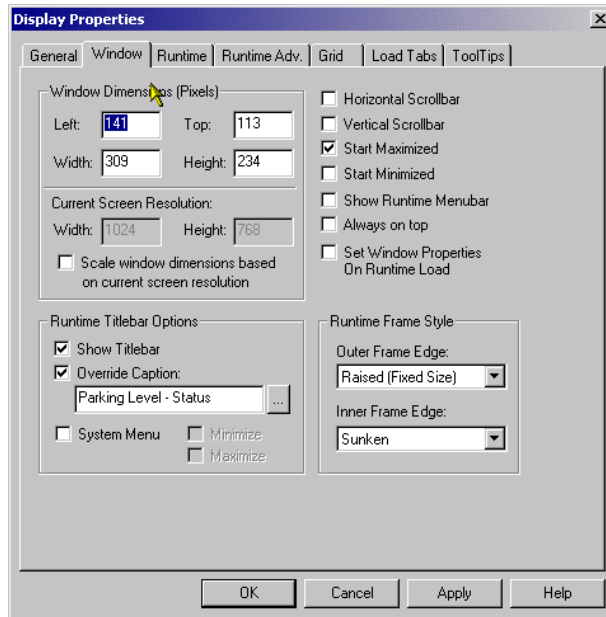


Figure 5.42

6. We will create a **Process Point** on the Popup Window in the same way we did on the main display. Select **Intrinsics**→**Process Point** from the **Dynamics** menu, or click the Process Point button  on the Dynamics toolbar.
7. Once the **Process Point** is selected just click anywhere on the display to open the **Property Inspector**. Set up the **PPT/DE** tab as shown in **Figure 5.43**.

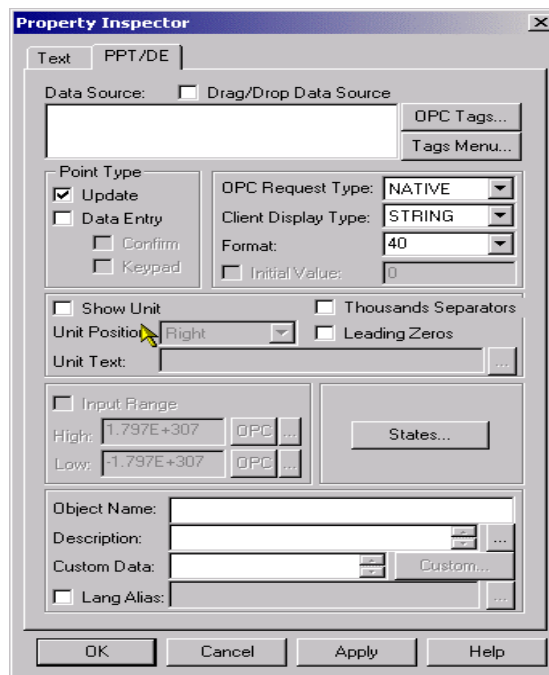


Figure 5.43

8. Select **Tags Menu**→**Expression Editor** (shown in **Figure 5.44**) in order to create the expression of the tag this process point will connect to.

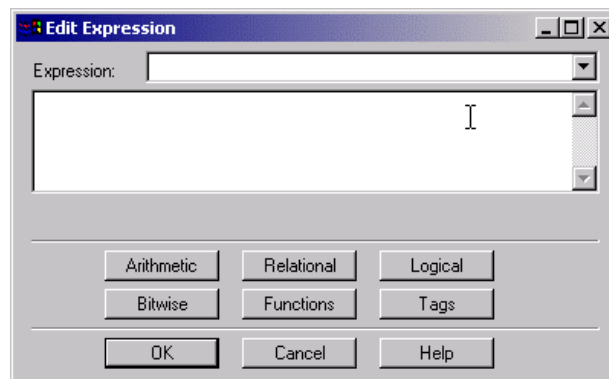


Figure 5.44

9. Enter the following expression into the **Expression Editor**:

```
"Parking in level "$+ tostring(<<level>>) +
if({ {ICONICS.Simulator.1\SimulatePLC.Sine}} > 0.5,$" is Full"$,$" is
available"$)
```

This expression will display “Parking in level [current level] is Full” if the value of the **SimulatePLC.Sine** tag is greater than 0.5, and “Parking in level [current level] is available” otherwise.

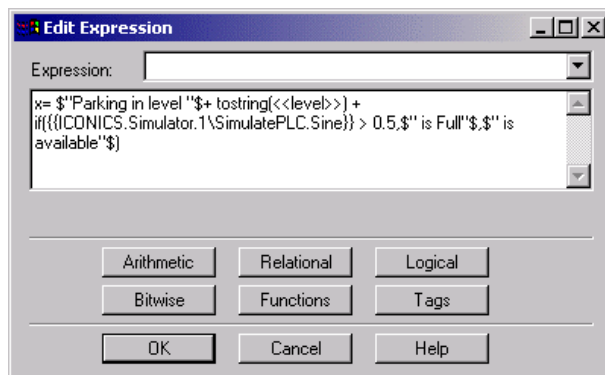


Figure 5.45

10. Once the expression is entered correctly, click **Ok** and **Save** the display.

11. Finally we will add a **button** using the  button on the **Dynamics** toolbar. Place it just below the Process Point and set the parameters as shown in **Figure 5.46**. Have the button caption, which by default is **BUTTON**, read **Close Window**, since this button will close the Popup Window when clicked.

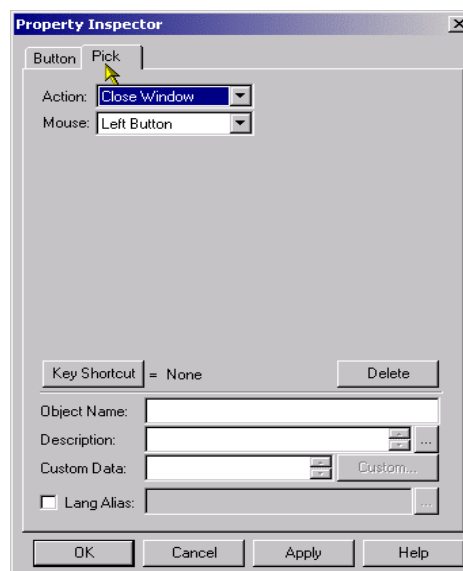


Figure 5.46

5.6 Creating the Airlines Network Display (with Active Link)

Finally, we will create the Airlines Network display that has an active link to the Logan Airport main display.

1. Create a new GraphWorX32 display in ProjectWorX as you did in Sections 5.5 and 5.6. Save this new display as **Airlines.gdf**.
2. First, open the **Display Properties** as before. On the **Window** tab set the **Width** to **812** and the **Height** to **612**.

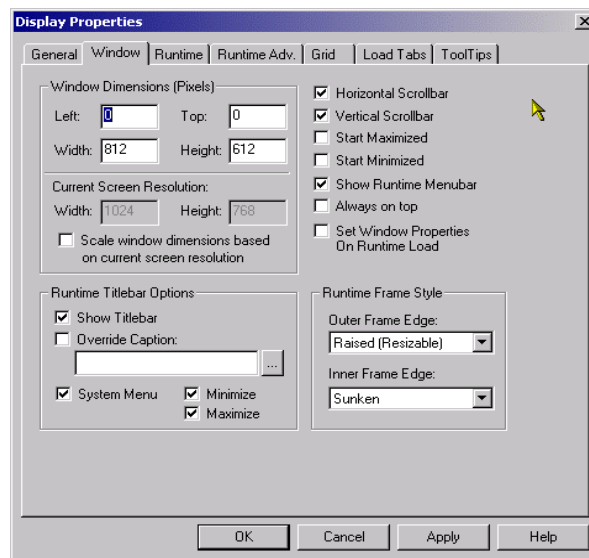


Figure 5.47

3. Now to start creating our display, select the rectangle icon  from the **Draw** toolbar, and create a rectangle at the top of the display to look like **Figure 5.48**.

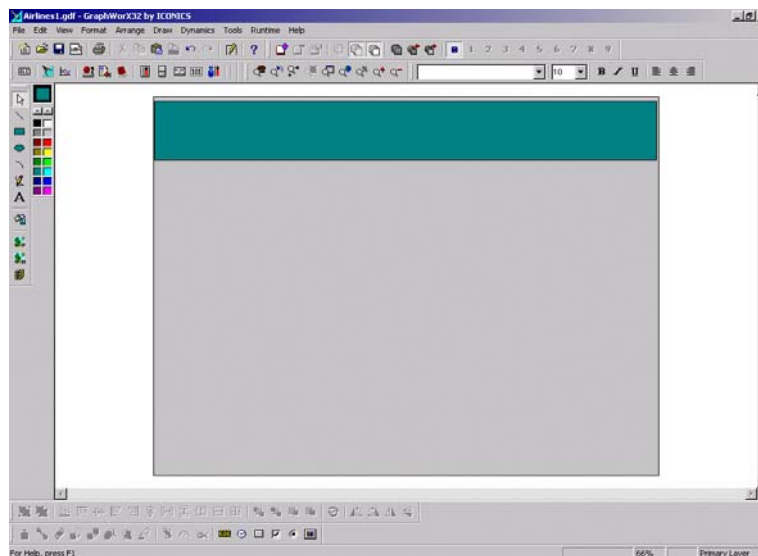
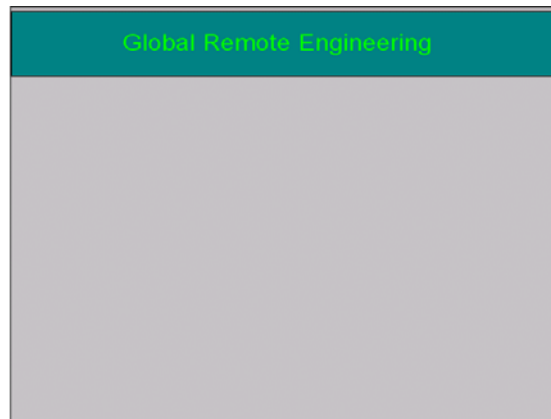
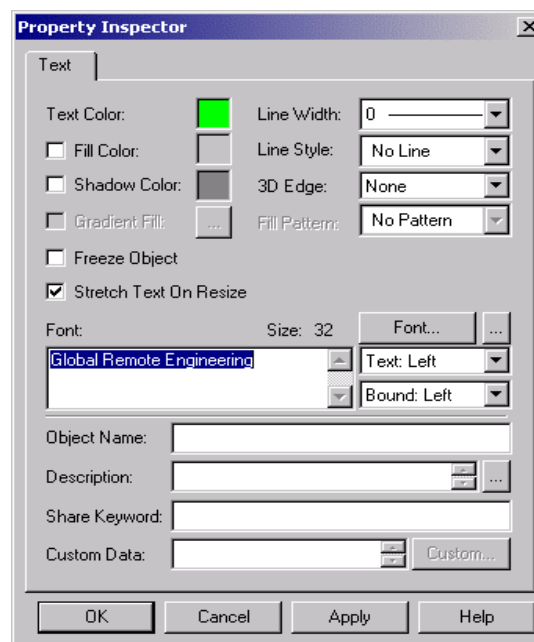


Figure 5.48

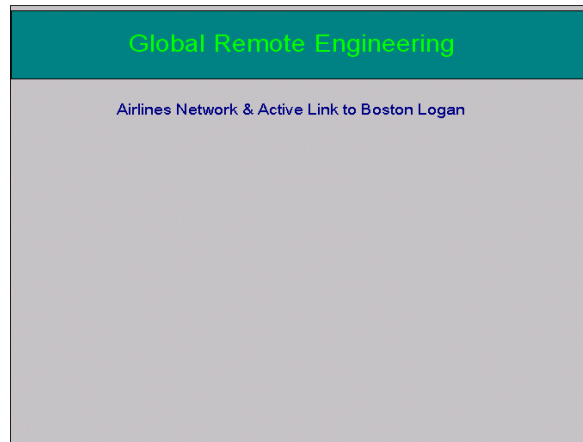
4. Now create a label to place on top of the newly created rectangle. Select the text icon  from the **Draw** toolbar, and type **Global Remote Engineering** on top of the rectangle.

**Figure 5.49**

5. We need to change the size and color of this text. To do so double click on the text to bring up the **Property Inspector** shown in **Figure 5.50**. Select **32** as the **Font Size** and change the **Text Color** to **fluorescent green**.

**Figure 5.50**

6. Just below this heading, we will add another text label that reads **Airlines Network & Active Link to Boston Logan**. After configure the text field, your display should look like **Figure 5.51**.

**Figure 5.51**

7. Next we will insert a picture that depicts the airline network. This picture is located in GraphWorX32 display used in Gen32Demo. Go to the **D:\Program Files\ICONICS\GENESIS_32\Examples\GEN32DEMO** directory and open the **USMap.gdf** display. Copy the airlines network map and paste it into your new GraphWorX32 file so that your display looks like **Figure 5.52**.

**Figure 5.52**

8. Now we will create a dynamic object that will bring up our main display that gives more detailed information about Logan Airport when clicked. Begin by creating a circular shape using on the circle tool button  from the **Draw** toolbar.
9. Draw a small circle over the area of Boston as shown in **Figure 5.53**.



Figure 5.53

10. Double click your newly created circle to open the **Properties Inspector** and choose a **Fill Color** of **Red**.
11. Create a copy of the circle and give it a **Fill Color** of **Yellow** in the same way.
12. Select both of the circles by holding down the **Shift Key** while selecting. With them both selected, either select **Selector**→**Digital Selector** from the **Dynamics** menu or click on the **Digital Selector** button  from the **Dynamics** toolbar. By applying a Digital Selector to these two objects we will give the illusion that a single object is flashing, based on the value of an oscillating Boolean tag.
13. In the Property Inspector shown in **Figure 5.54**, select **1:** (representing the first object) and click **OPC Tags**.

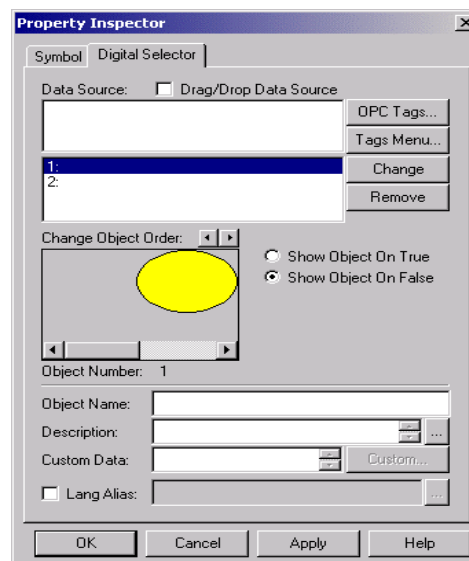


Figure 5.54

14. In the **Universal Tag Browser** select the **BIT** tag from **My Computer**→**Data Access**→**ICONICS.Simulator.1**→**SimulatePLC**→**INPUTS**, as shown in **Figure 5.55**.

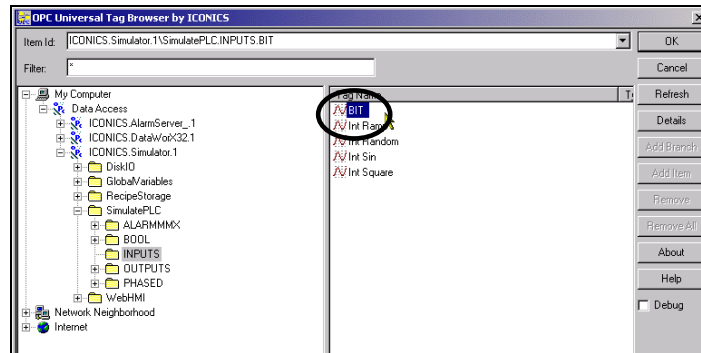


Figure 5.55

15. Click **Ok** to return to the **Property Inspector**; the **BIT** tag will now be listed as the **Data Source**.
16. Highlight **Data Source** and click **Change** to replace **1:** with the tag definition. Also, select the **Show Object On False** radio button. Your **Property Inspector** should now look like **Figure 5.56**.

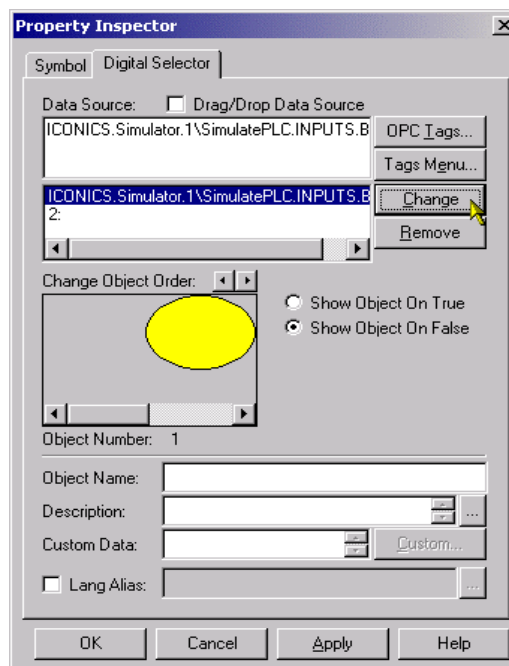


Figure 5.56

17. With object two (**2:**) selected, repeat steps 14-16, but select the **Show Object On True** radio button for this object. Your **Property Inspector** should now look like **Figure 5.57**. Click **Apply** and **Ok** to return to the display.

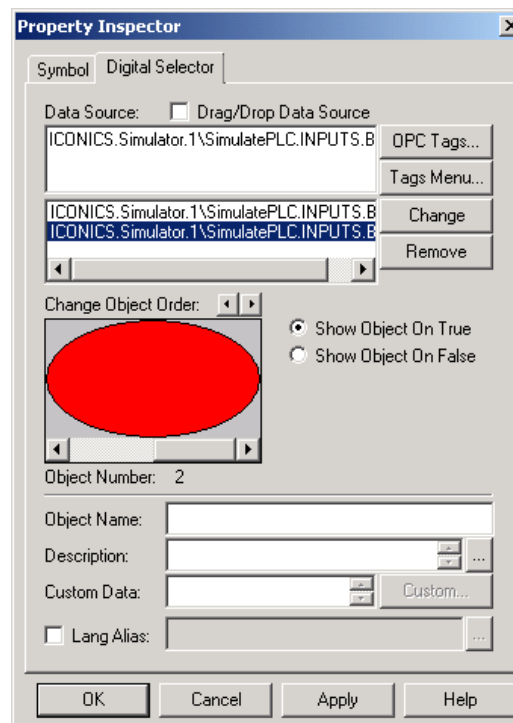


Figure 5.57

18. Right-click on one of the circles and select **Edit Symbol**. Now move one circle directly over the other and **double click** outside the object so the circle has **red boxes** around it. Finally move that circle over Boston. Your display should look like **Figure 5.58**.



Figure 5.58

19. Our final step is to add a **Pick Action** to our dynamic circle symbol that will open our main **Logan_Airport.gdf** display. Select the dynamic symbol and select **Actions→Pick** from the **Dynamics** menu.

20. In the **Properties Inspector**, select a **Pick Action** of **Load Display**. Enter a **Filename** of **Logan_Airport.gdf**. Recall that we do not have to enter the entire path here because we have saved all of our displays in the same directory. Click **Ok** to close the **Properties Inspector**.
21. Save this display and enter runtime. You should now be able to click on the flashing symbol located over the Boston area, and **Logan_Airport.gdf** should open. Within this main display, you should be able to select any of the terminals and see the appropriate flight lists. If you click on the parking area of the display, you should be able to choose any of the parking level menu items to see a Popup Window showing that level's availability.

GENESIS32 Security

6

6.1 Introduction

The ICONICS GENESIS32 Security System provides restricted access to GENESIS32 functions based on the concept of a logged-in user. A Security System Administrator configures the system by adding users and assigning them specific GENESIS32 privileges. In addition, administrators may associate users with certain administrator-defined groups that also have assigned privileges. Thus, a user has the effective rights of all the groups to which he or she belongs plus his or her own private rights

6.2 Objectives

This lab exercise is intended to explain the Security concept applied to GENESIS32. After completing this Lab you should know how to:

- Create a new Group and a new User
- Configure security for the Default group
- Configure security for an user defined group
- Secure an operator entry under password.

6.3 Starting the Security Configurator

One of the biggest problems using a SCADA product in to restrict the operator to do actions that can create serious damages to the plant. In a real application there are lots of conditions where security is required and where it is necessary to allow access to certain functions only for the qualified personnel. Some examples are set point modification or specific display loading even the restriction to exit from runtime mode. The ICONICS system gives you the possibility to lock a default user from most of the functions and allow a different user to be able to perform exclusive operations.

1. Now let's start the ICONCIS Security Configuration from the System Tools list in ProjectWorX32, as shown in **Figure 6.1**.

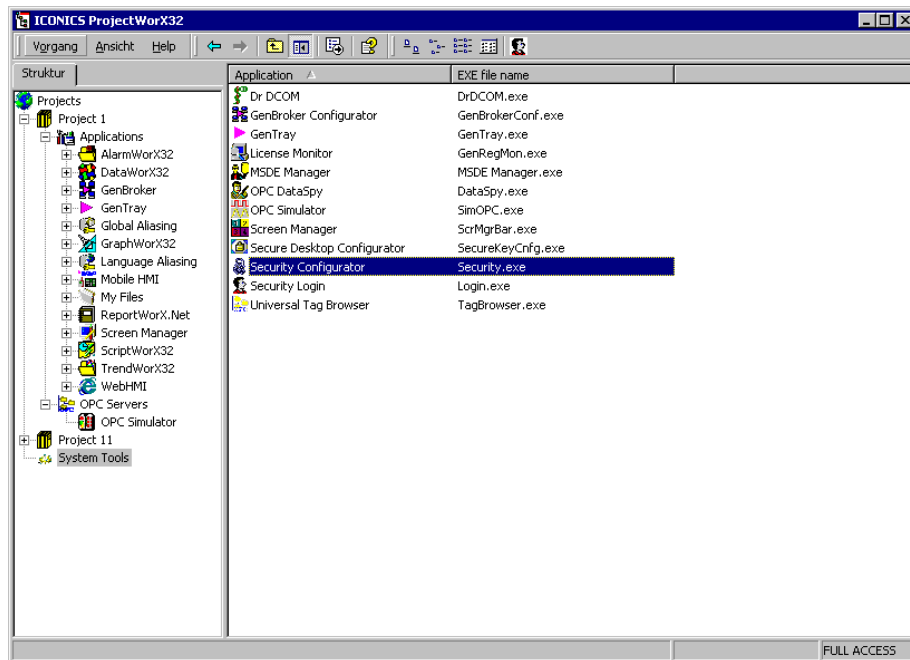


Figure 6.1

2. Type the **Administrator password** that you assigned during the GENESIS32 installation, if nothing has been changed that should be **ICONICS** in caps.

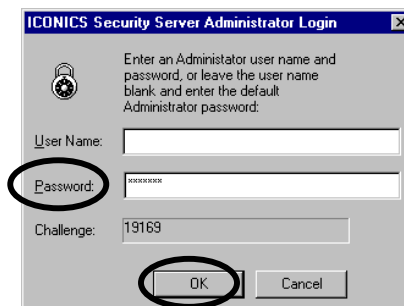


Figure 6.2

6.4 Basic Security Mode

Basic mode limits the configurability of the security system with the aim of easy configuration and predictable runtime results. The following restrictions are imposed when in basic mode:

- The **Default Group** is disabled for editing and allows no access at runtime.
- Only **User Properties** can be edited in the **User** dialog.
- Security access rights are assigned only to groups.

- A user must be associated with one and only one group. In basic mode, this association can be made directly from the **User Properties** dialog box.

To configure the Security Server in Basic Mode:

1. Select **File New** and for the first part of the security lab we will configure a file in basic mode thus Click **Yes** to the message box shown in **Figure 6.3**.

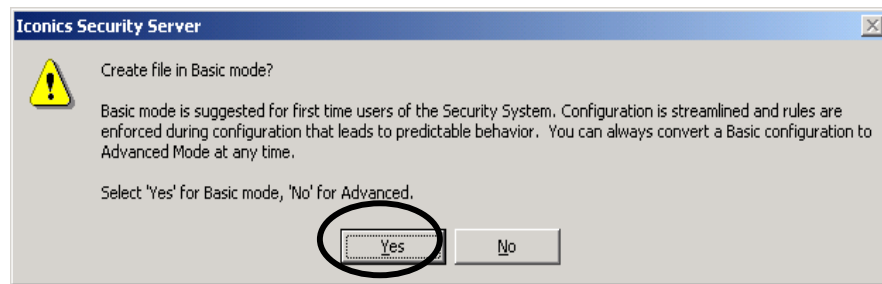


Figure 6.3

2. Just after clicking **Yes** you will need to save this file with the name **Training.SEC**. From here we will create a security group, click the  icon circled in **Figure 6.4**.

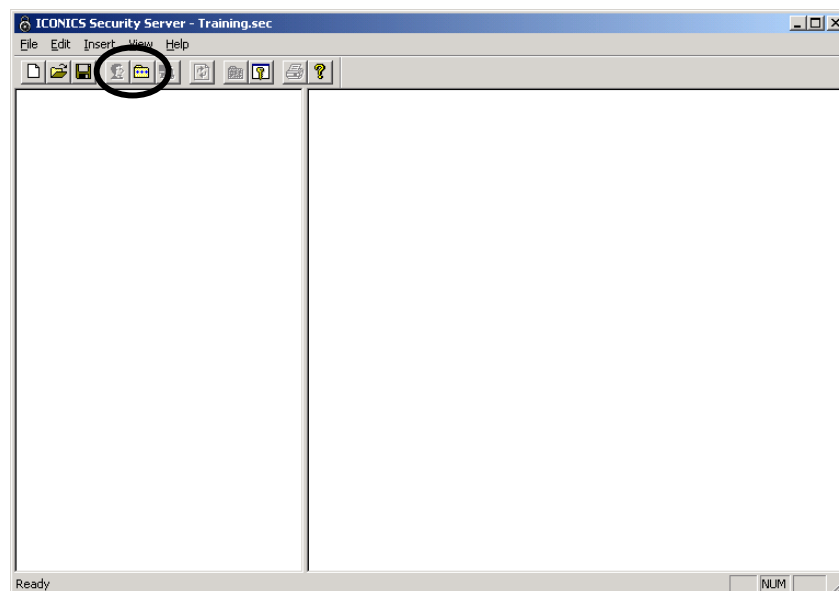


Figure 6.4

3. Now give this new security group a name **Training**.

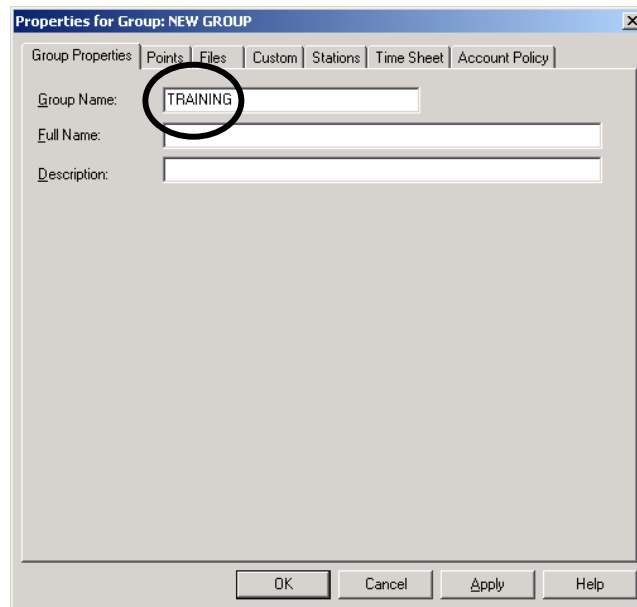


Figure 6.5

4. We will set up the permissions for this newly added group, first select the **Points** tab. In the include box write an asterisk and click the **Add** button, this will put that asterisk in the large box below and is shown in the picture below. Basically doing this will allow all users associated with the **Training** group permission to view and change all points.

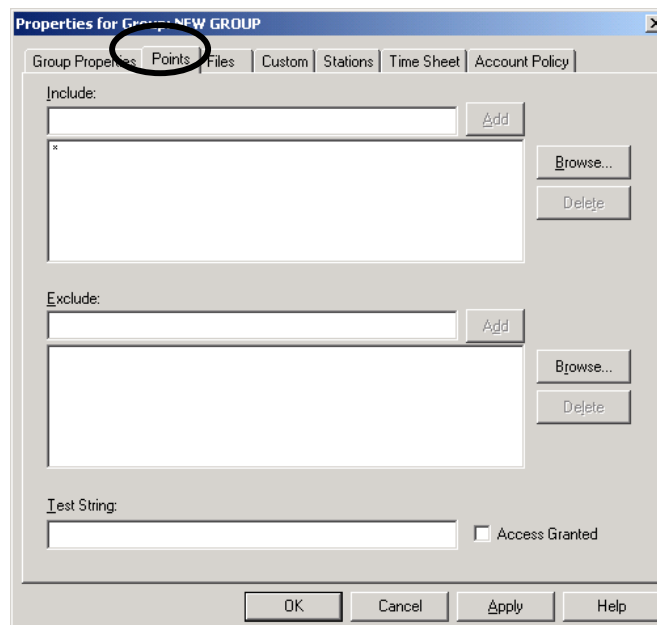


Figure 6.6

5. On the **Files** tab we will put an *.* in the include box and click the **Add** button so now all users associated with this group will be allowed to view and update all files.

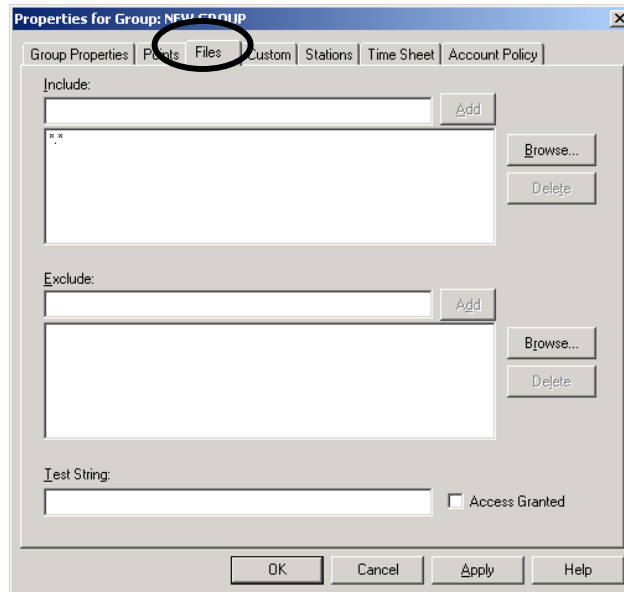


Figure 6.7

6. We will leave the **Custom**, **Stations**, and **Time Sheet** tabs alone, now to the **Account Policy** tab. Make sure that **Password Never Expires** is checked along with **Never Logout**. Finally we will click **Apply**, and **OK**.

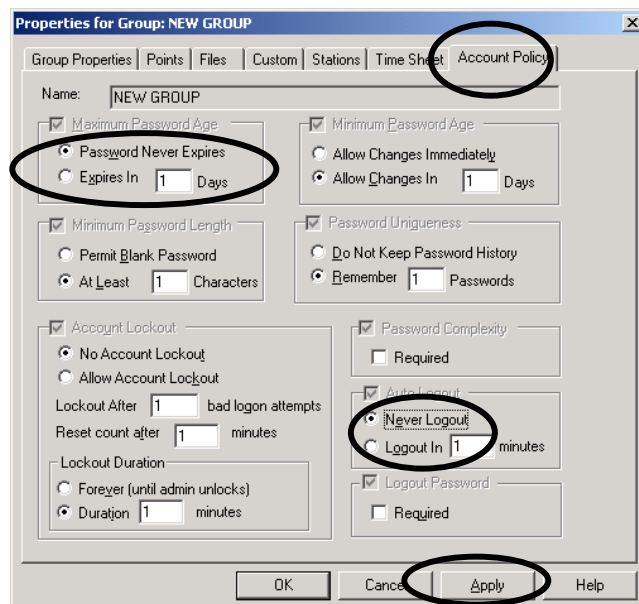


Figure 6.8

7. Now having set up our First group we will go ahead and create a user for that group. To do this click on the  icon that is circled in **Figure 6.9**. This will add a user to the right side of the security configurator and bring up the user properties dialog box. Set this user name to **Administrator** and set the password to **test**, you will have to verify this password also. For **Group** use the drop down menu and select **Training**. We will need to make sure that we have **User Cannot Change Password and Security Systems Administrator** checked and you will have to uncheck **Account Disabled**. Finally click **Apply** and **OK**.

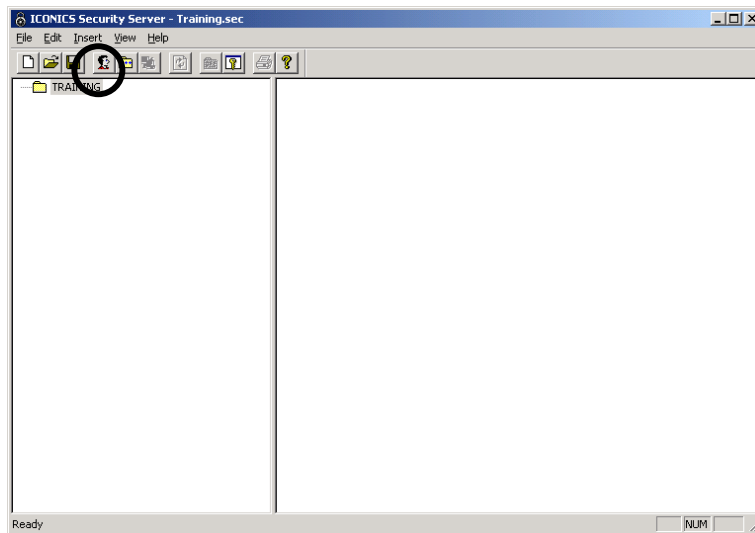


Figure 6.9

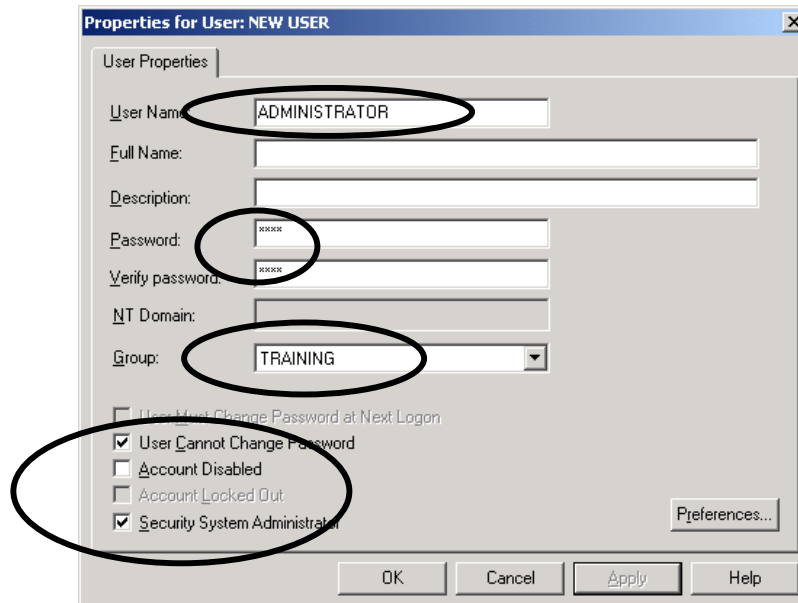


Figure 6.10

8. Following the setup of the account permissions for the administrator, you have to set up the access permission. Go to **Edit -> Application Actions**, and select the plus sign next to the **Training** group on the right. To have full access to all ICOINCS applications you will need to make sure that all the modules on the left are located also on the right under the **Training** group. Use the **Move** button to do this.

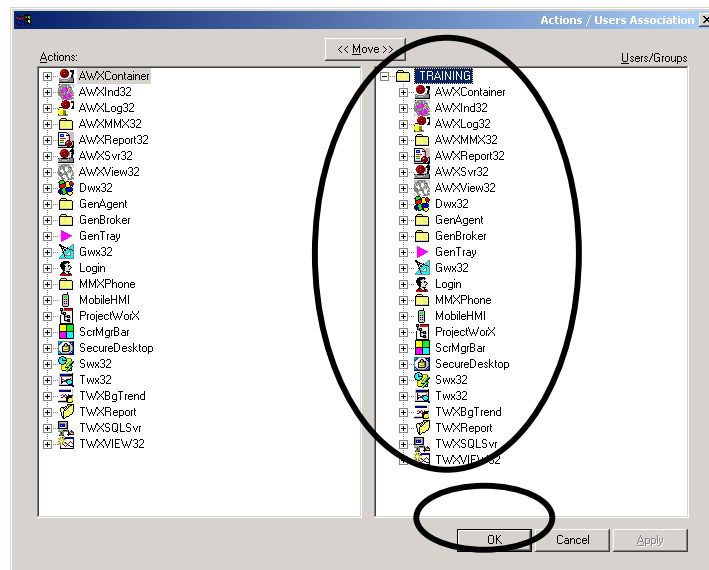


Figure 6.11

9. Finally having set up your administrator you can now go back and create a new group for example **Users** and add new users to that group and you could restrict their access to different applications.

Basic Mode in Action:

10. To see how the above file works in real, save the file and close it. Go to **Start -> Programs -> Genesis32 -> Tools -> Gen32 Demo** to run the Gen32 Demo.

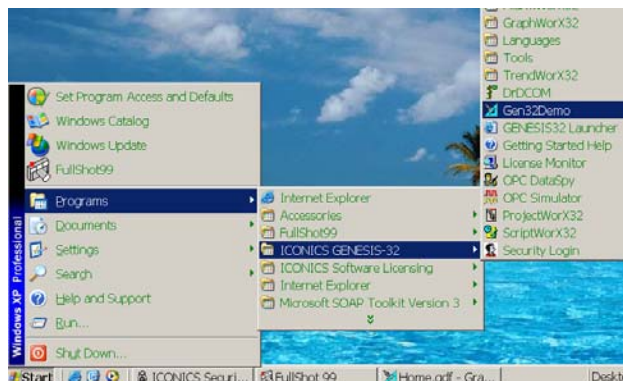


Figure 6.12

11. Since you are NOT logged into ICONICS Security yet, you are NOT allowed to run anything (including Gen32 Demo, which is nothing but GWX32 in runtime). See **Figure 6.13**.

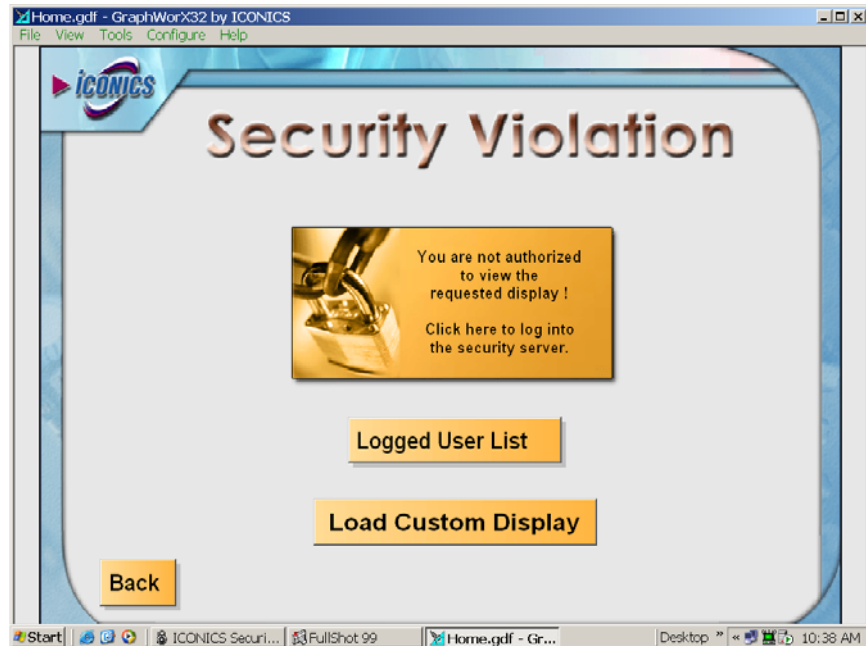


Figure 6.13

12. To gain access in this situation, click on the center big yellow rectangle to bring up the SECURITY LOGIN dialog as **Figure 6.14**. Log in as **Administrator** with **test** as the password (you had set this in previous steps).



Figure 6.14

13. After you login, you now have access to all files and all application actions. So, you will see the Gen32Demo start as in **Figure 6.15**.



Figure 6.15

14. If you let this display run, you will notice that you (a user called Administrator) will get kicked out of security after 1 minute. This is because the TRAINING group had **Auto Log out** after 1minute under its **Account Policy** tab.
15. After security expired, log in again. Since the Administrator user also happens to be the **Security System Administrator**, he/she has additional privileges. You can click on the **Advanced** button on the **Security Login** dialog and see who is logged in and when they are set to auto logout. See **Figure 6.16**.

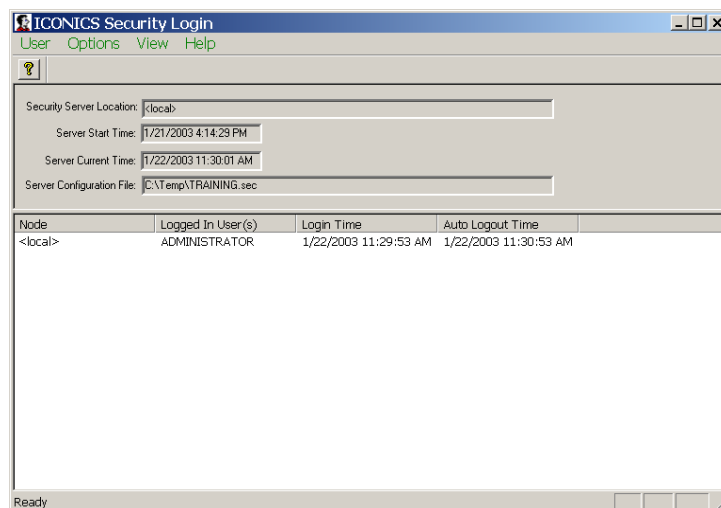


Figure 6.16

6.5 Advanced Security Mode

The advanced security configuration mode is equivalent to the only security mode in previous versions of GENESIS32. To configure the Security Server in advanced mode:

1. In the **Security Configurator**, select **New** from the **File** menu. A dialog asks you if you want to create the file in basic mode. Click **No**.

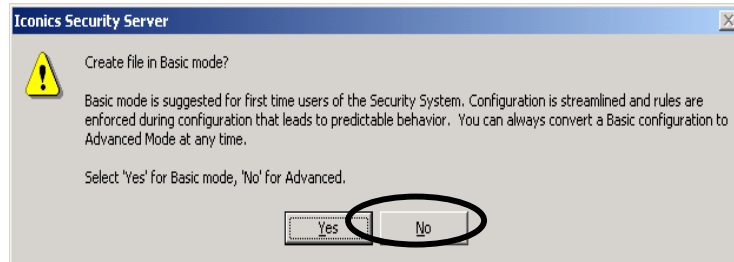


Figure 6.17

2. After selecting **No** there will be a prompt to select the method of Integrated NT Security groups you want to use. We will select **Local Computer**. By selecting Local Computer, this creates a simulated integrated NT security configuration. The users and groups will be synchronized with the accounts on the local computer.

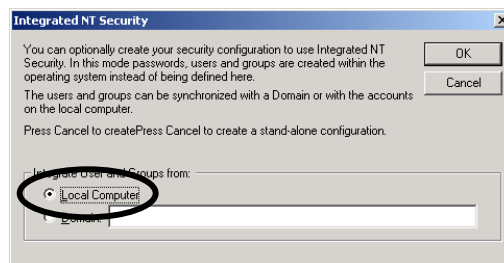


Figure 6.18

3. Following that we will set the name of the new security file to **AdvTraining**.

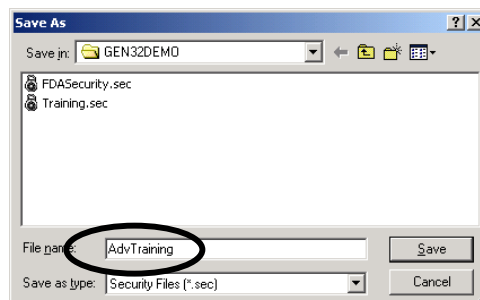


Figure 6.19

4. Once the file has been saved you will see that the security server is automatically populated with users from the local computer.

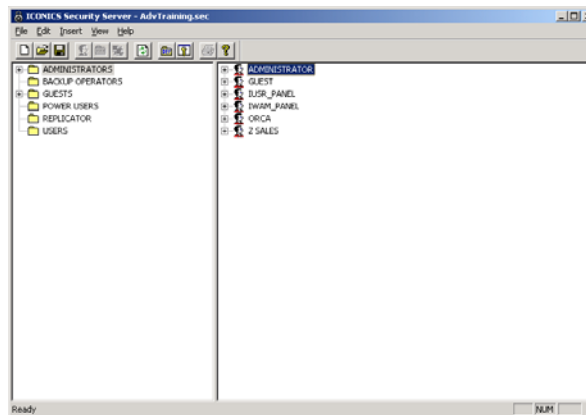


Figure 6.20

5. Now with all the windows users in Iconics security you will have to configure the account permissions for each user, or you can do it at the group level. We will configure the Administrators. Highlight **Administrators**, right-click and select **Edit**. Here we will set the administrator account permissions.

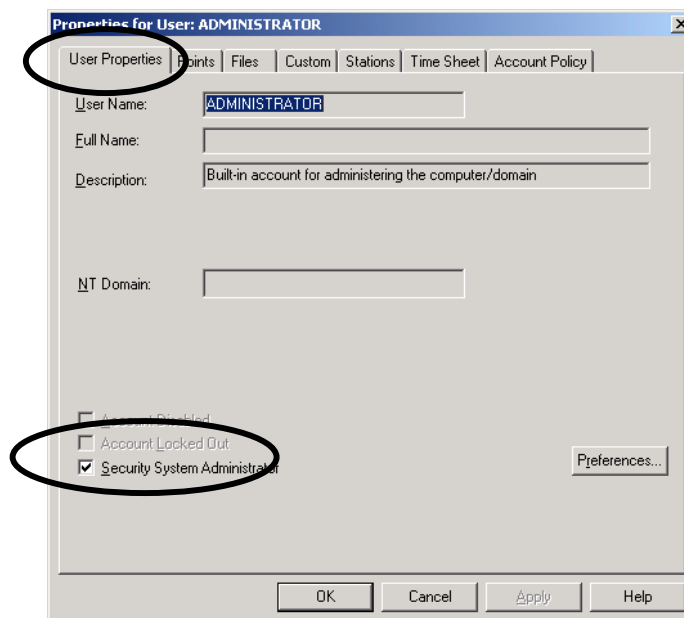


Figure 6.21

6. In the **Points** tab include the asterisk just as before, giving administrators access to all tags on the machine.

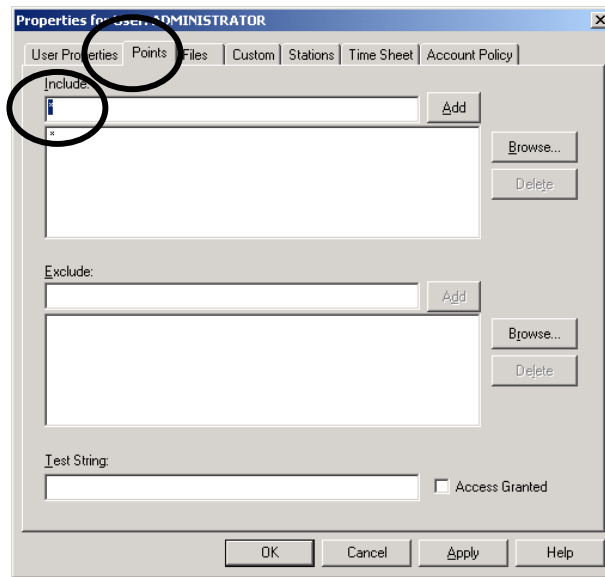


Figure 6.22

7. In the **Files** tab we will include *.* which will represent all files.

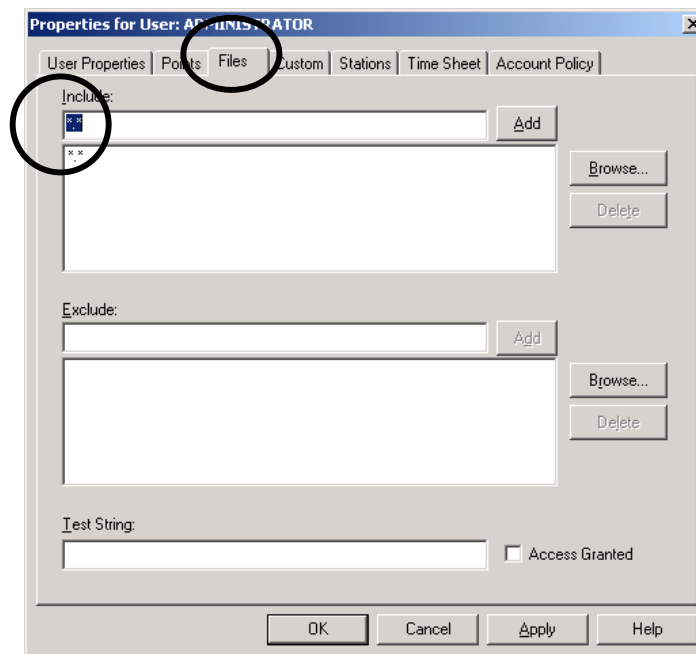


Figure 6.23

8. And finally onto the **Account Policy** tab. Select **Auto Logout** and **Never Logout**.

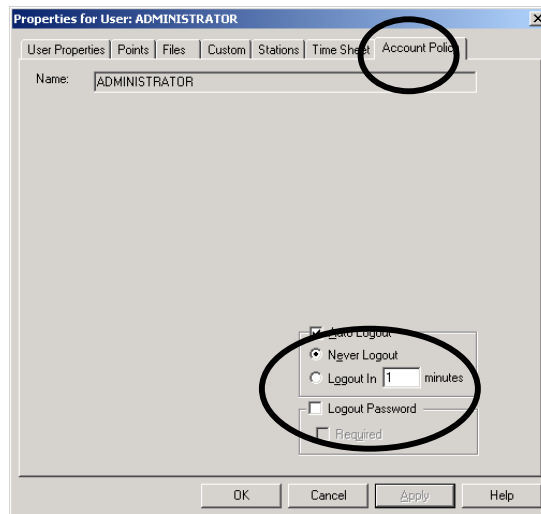


Figure 6.24

9. Go to **Edit→Application Actions** and give all application action privileges on the right-hand side to the **ADMINISTRATORS** group. (Do so by clicking on the application on right side and clicking Move button, or by right-clicking the group and selecting **Add All Actions**).
10. Once the access permissions are set for each individual user or group, note that in the **Application Actions** window there is a listing in the **Users/Groups** called **Default**. These are the access permissions that a user will have if he/she does not log into Iconics security. We will just give the default user access to GraphWorX32. Do this by highlighting the **Default** icon on the right, then **GWX32** on the left, and click the **Move** button. Now the only module that a user will have access to without logging into Iconics Security will be GraphWorX32. Finally click **Apply** and **OK**.

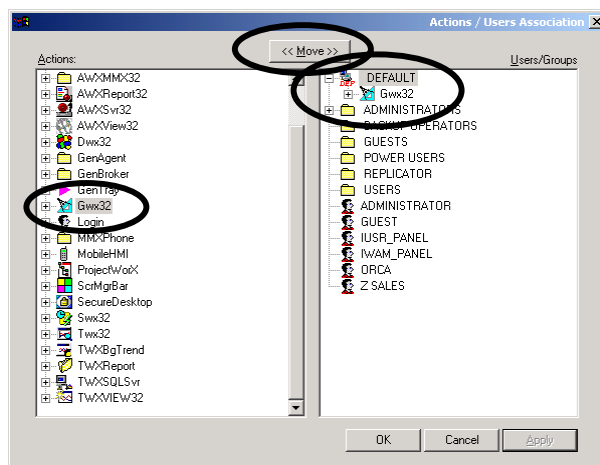


Figure 6.25

11. After editing the access permissions for the **Default** group we will set up the account permissions. Go to **Edit→Default Group**. On the **Points** tab we will include the asterisk.

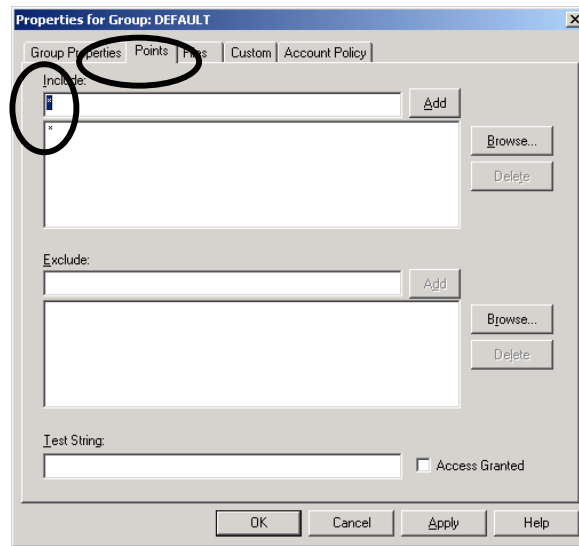


Figure 6.26

12. On the **Files** tab we will include *.*.

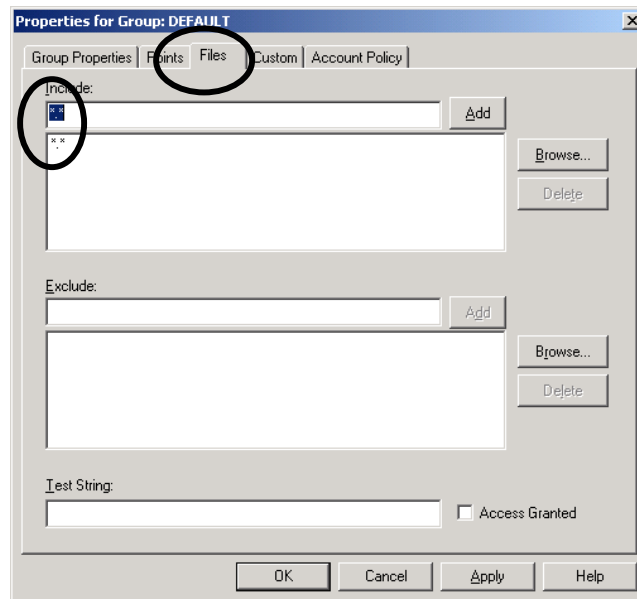


Figure 6.27

13. And finally on the **Account Policy** tab we will make sure that the **Auto Logout** is set to one minute. Then click **Apply** and **OK**

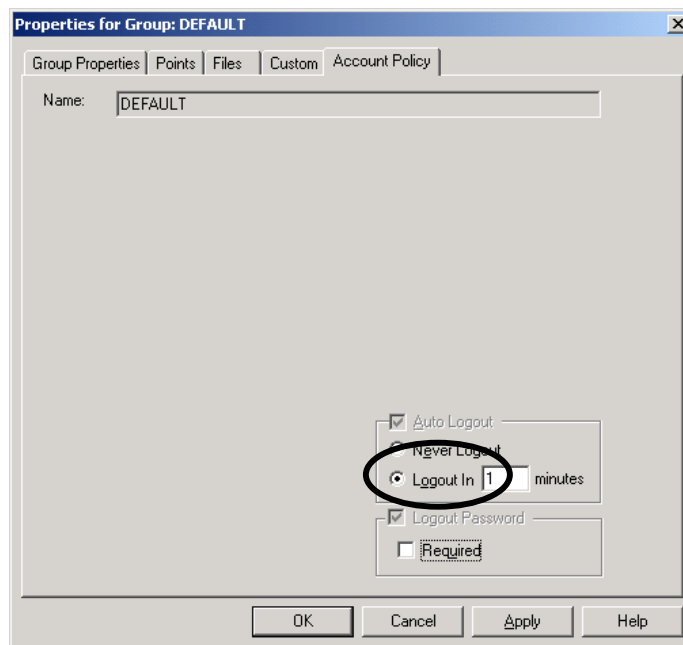


Figure 6.28

Advanced Mode in Action:

14. To see how the advanced mode file works, save and close the created file. Since you are not yet logged into Iconics Security, you have the rights of the **Default** group. Click on **Start→Programs→GENESIS32→TrenWorX32→TrendWorX32 Configurator**, or open the TrendWorX32 Configurator from the **Applications** section of **ProjectWorX32**. You will see the message in **Figure 6.29** saying access is denied and that you do not have permission to run the application.

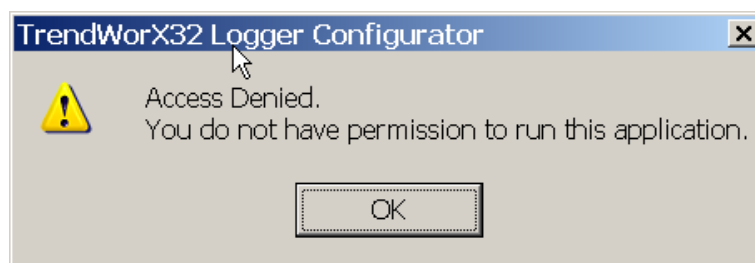
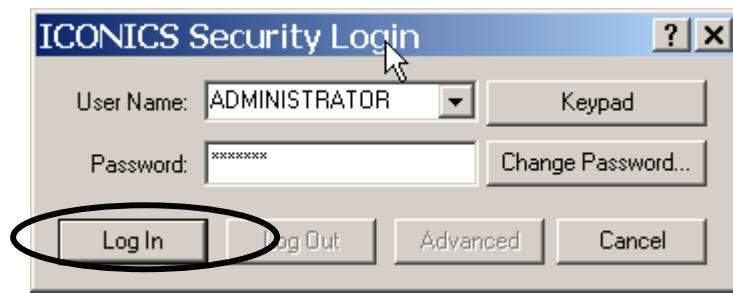


Figure 6.29

15. To get out of this lockout situation, go to **Start→Programs→GENESIS32→Security Login**, or open the Security Login from the **System Tools** section of **ProjectWorX32**. Please log in here as **Administrator** with your windows administrator password.

**Figure 6.30**

16. Having logged in as Administrator who has access to all applications, try to open the TrendWorX32 Configurator again, and it should work just fine.

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