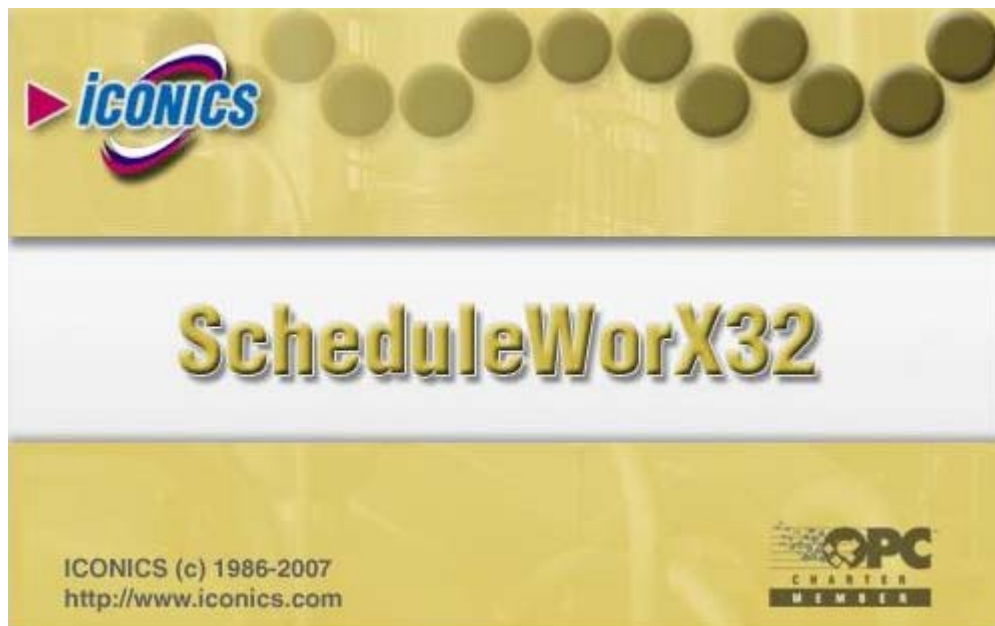




ScheduleWorX32 v9.1



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Getting Started

Schedules are a collection of named events that are linked to the instance of a resource. As an example, a light or group of lights can have a schedule assigned to it (them). A schedule can be a single event or set of events. Events are schedule items, and can occur periodically. Schedules are collections of events, and schedules can also be defined to reoccur.

Schedules are linked to a set of tags or valuesets, and when a schedule event begins it reads the value of the tag, and if necessary writes a new value to it. Depending upon the asset being controlled valuesets can be a variety of datatypes: booleans, integers, and so forth. Since a schedule can define a set of events, you have fine control over the resource you have scheduled. That is, you can have lights turn on at the beginning of a schedule in the morning, dim during the middle of the day, turn up at dusk, and return to low light conditions when evening turns to night. You could also have the level of the light react to a sensor that measures the light that enters through your skylights and adjusts the lighting appropriately by using advanced expressions in your valueset.

Your base schedule is a set of weekly events. You can define holidays that are observed in your country or by your organization. Schedules that are assigned to those holidays override regular schedules that you have created that would run on that day. However, you can create events that are exceptions, and exceptions are imposed in place of any other events.

When a schedule has two or more events that overlap a conflict exists. ScheduleWorX32 allows you to set priorities to each event in a schedule, and the program uses these priorities to determine which event applies at the time of conflict. A monitor view allows you to see which events are currently in force; and a diagnostic view shows event information pertaining to the configured schedules so that you can determine why your assets are responding as they are.

There are two types of schedules:

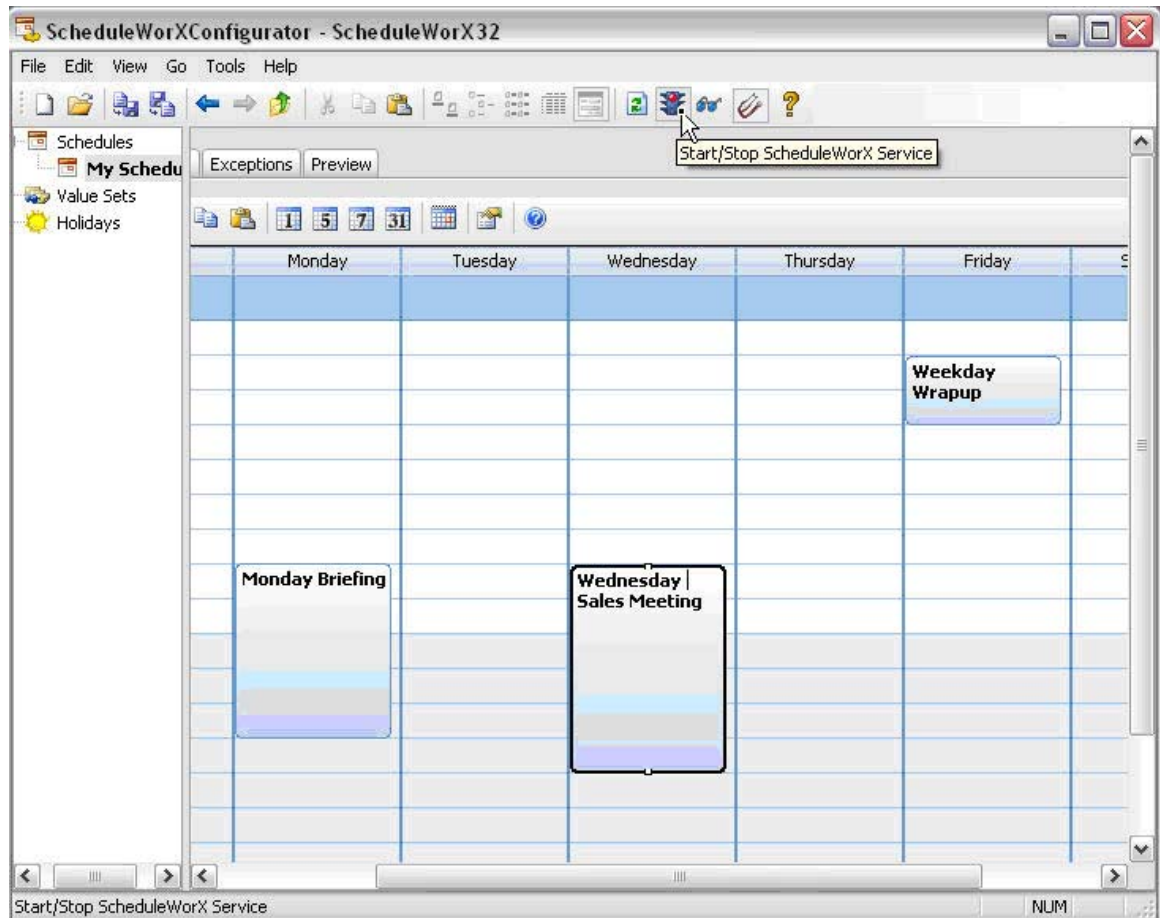
- **Control schedules.** These types of schedules modify the action or condition of a resource based on the Schedule items or events that you create.
- **Availability schedules.** These types of schedules assign a status to resources based on that resource's availability.

Note: The schedules that you create in ScheduleWorX32 are control schedules. Availability schedules can be created in the Unified Data Manager, and are displayed in that utility to be used in expressions.

Starting and Stopping ScheduleWorX32

ScheduleWorX32 consists of a GUI interface in which you create and modify schedules, and the scheduling portion of the Unified Data Manager (UDM) runtime service which serves as the event engine for your schedules. The figure below shows the ScheduleWorX configurator in its Weekly mode.

The ScheduleWorX32 configurator.



There are three schedule items defined in this schedule above, one for Monday, Wednesday and Friday. Once the schedule is completed and ready to be enforced; the Traffic Light icon in the toolbar can start and stop the ScheduleWorX32 Service, which is a component of the UDMRuntime.exe. Refer to the User Interface section of the help file for more information about the Configurator.

Schedules and Tags

Schedule events are used to modify the value of the tag that controls the resource which could consist of tags with different data types. Thus a Schedule item can not only turn lights on and off which would be represented by a Boolean (1 or 0) value, but could dim the lights to a specified voltage (60 volts), a percentage of the voltage available (50, or 50%), or represent a the measure of the voltage as a floating point value (32.5) affording control at a finer granularity. The condition of a resource is represented by a tag stored in a data source, which is generally an OPC server. So when you alter a value that is associated with a tag you control the resource.

With a schedule you can:

- Assign a resource defined by a valueset to a schedule
- Set the boundary condition (start and stop) for a schedule
- Add events to the schedule and assign start and end times
- Set the value of the tag associated with the resource during the time of an event in the schedule

- Set the frequency that a schedule event occurs

Managing ScheduleWorX32 Databases

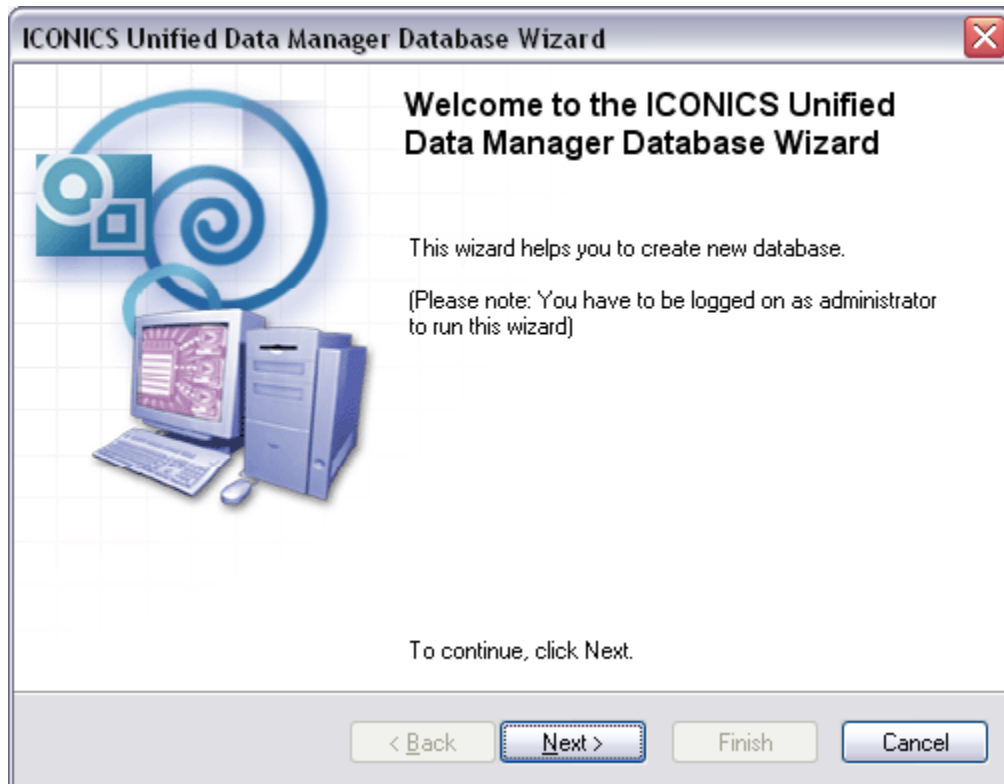
The scheduling data used and stored by ScheduleWorX32 is stored in the active Unified Data Manager (UDM) database. That database can be a Microsoft Access database, or in another database such as SQL Server. You can connect to MS Access directly, or through a Universal Data Link (.UDL) file to a different database. A UDL file uses the Microsoft Data Access Components (MDAC) common user interface to specify the necessary connection information to the data provider to establish the data link with a compliant database.

When you open ScheduleWorX32 for the first time there will be a sample database, but you should create a new database in which to store your schedule data.

To create a new database, do the following:

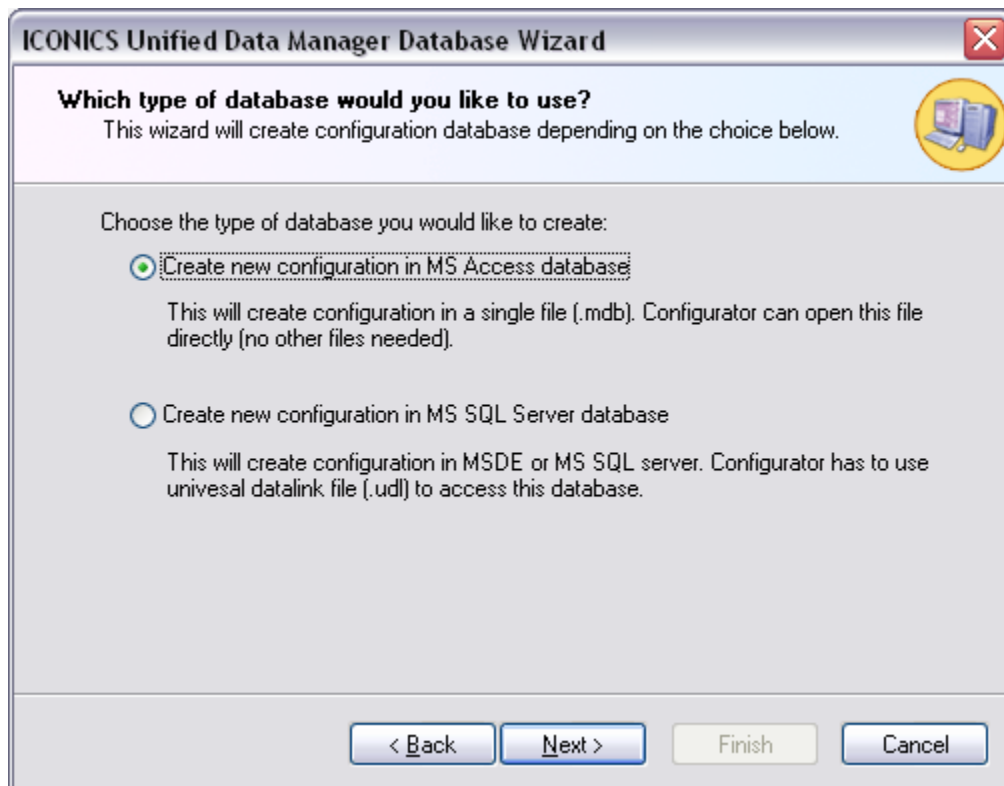
1. Click **Start, All Programs, ICONICS Tools**, and then select the **Unified Data Manager** command.
2. Click on the **File** menu and select the **New** command (Ctrl+N). This will launch the Database Creation Wizard; click **Next** to continue.

The UDM Database Wizard



3. Choose the **desired type** of database, either an MS Access database or an MS SQL Server database as shown in the wizard below, then click the **Next** button.

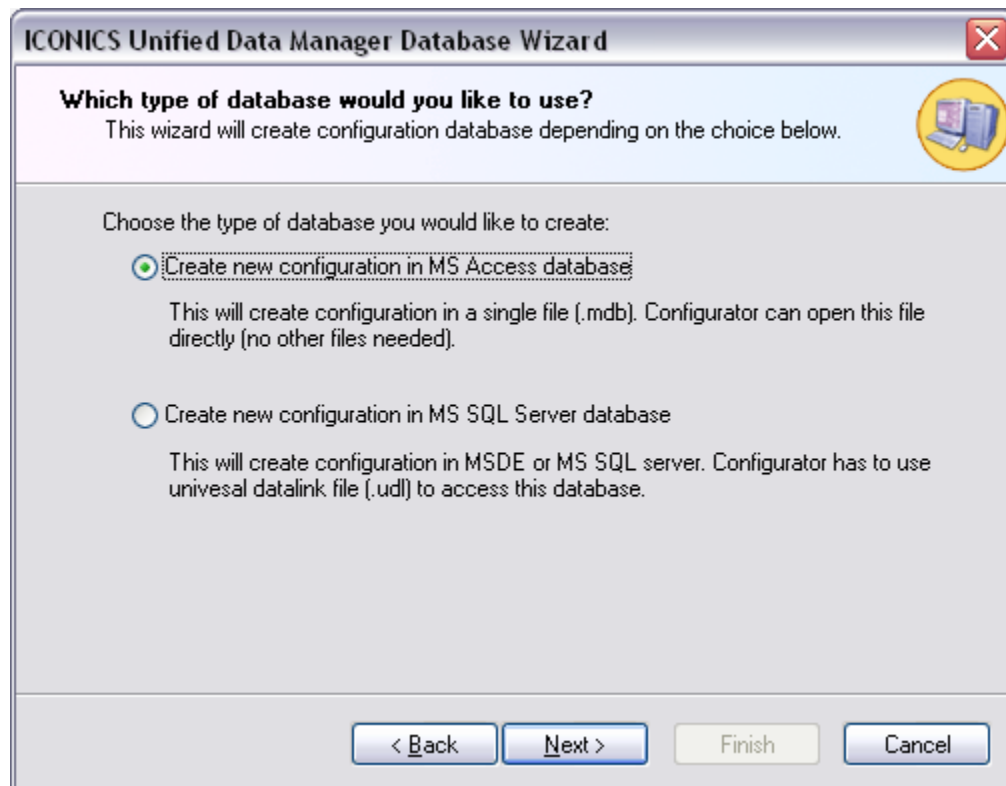
The default name is "ScheduleWorXConfigurator," the default database type is a Microsoft Access database, and the default location is %Systemdrive%\All Programs\ICONICS\GENESIS32\BIN.

Selecting the database type.

4. Enter the **name and path** of your configuration and **enable** the Make Database Active check box, then click **Next**.

The default name is "DataManager," the default database type is a Microsoft Access database, and the default location is [%Systemdrive%Documents and Settings\All Users\ICONICS\](#).

Entering the file name.



5. **Navigate** the file system to the directory that will contain your database file, then click the **Save** button.

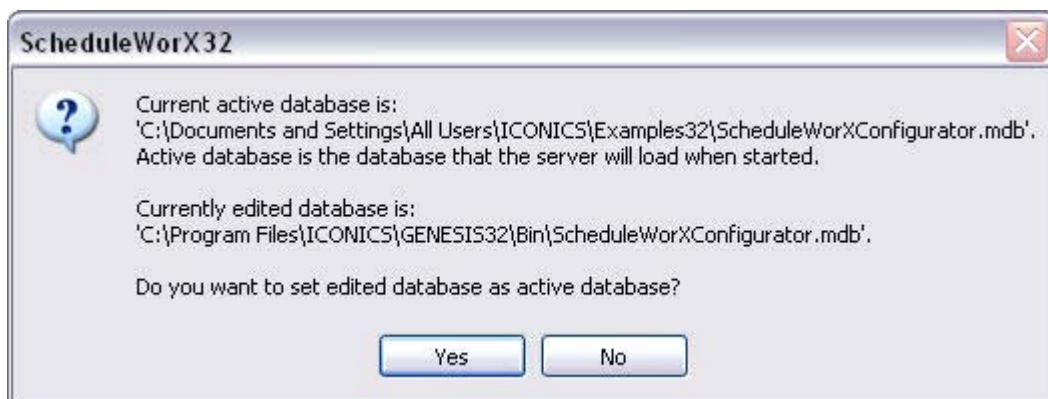
Once you create the database file and have selected to activate that database it opens in ScheduleWorX32 by default.

To activate a database, if you have not already done so:

6. Click on the **File** menu and select the **Make Active** command.

The alert box show below appears asking you to confirm the change in the active database assignment.

Active Database alert box.



7. Click on the **Yes** button to enforce your selection.

If you want to switch to another database you will need to open that database. You might want to switch to a second database if you want to control schedules in

another domain, or if you are a developer and you want to work on the schedule for different departments, or for different companies. There are a multitude of reasons why you might want to store data in different databases, and all of ICONICS applications have this feature to permit this level of flexibility.

If you want the new database to be your active database you will also need to repeat the Make Active command after you open the database you specify.

To open a database:

1. Click on the **File** menu and select the **Open** command.
2. In the Open dialog box click on the **Files of Type** drop down menu and select either:

Microsoft Access Database (*.mdb)

Universal Data Link (*.udl)

3. **Navigate** the file system, highlight the database you wish to connect to, and **double click** on that database.

If this newly specified database will be your default database, don't forget to apply the Make Active command as described just above.

All databases are subject to fragmentation at the sector level. When you delete values, perform import and export operations, or do anything that WRITES to a database you leave data structures that aren't accessed sequentially on disk and aren't therefore optimized for best performance. Some databases automatically perform defragmentation operations, accepting a certain hit in performance on an on-going basis. Microsoft Access does not. You need to compact Access databases very so often in order to reduce the file size, store data structures sequentially on disk, and improve system performance.

To compact a Microsoft Access database:

4. Click on Tools and select the Compact/Repair MS Access Database command.

The Compact/Repair MS Access Database dialog box.



5. Select the **compact options** you desire, then click the **OK** button to perform the operation.

The Connected Configuration Database option is the default option. However, you can compact other databases using the Other Database option, as well as specify whether or not to provide login or security credentials. Some database use their own security system, others use NT Authentication, while still others have no login required at all. The Backup original database before compacting starts (recommended) option is provided so that if the compact command corrupts your database that you have a fallback copy to revert to.

Alert: Take note of the alert at the bottom of the Compact/Repair MS Access Database dialog box. If you try and compact a database that has connected users you may end up damaging that database. At best your information will no longer be complete; at worst you may no longer be able to open that database. Therefore, make sure that the database has no connected users prior to compaction, and that you have a suitable copy to revert to just in case.

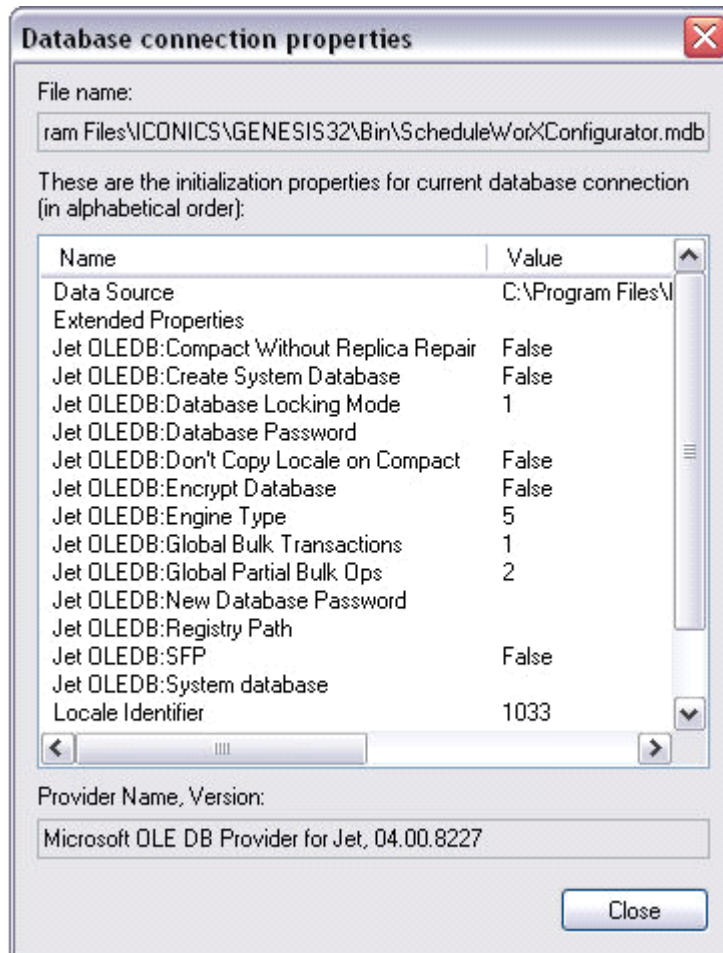
ScheduleWorX32 comes with a utility that displays information about the database that you are currently connected to. Information includes not only the name and path to the database, but version numbers of the OLEDB object and other properties. This dialog box isn't live, and therefore doesn't display information about the number of connected users. However, it can tell you the current data source.

To view the Database Connection Properties:

Click on the File menu, and then select the Database Connection Properties command.

The dialog box appears as shown below.

The Database Connection Properties dialog box.



Once you have connected to a database and activated that database you can create a schedule, and assign events to that schedule. The topic [Create a Schedule](#) details the procedure for adding a schedule, which serves as a container for events. To create the specific type of event you wish to add to your schedule (regular, holiday, etc.) refer to the [Events](#) topic.

Installation

You can Install ScheduleWorX32 either as a standalone package, or as part of the GENESIS32 9.10 Automation Suite. You should refer to the installation instructions of GENESIS32 for the suite installation procedures if you are installing ScheduleWorX32 along with some or all of the GENESIS32 components. Instructions for the standalone installation follows below.

To install ScheduleWorx32 as a standalone installation, do the following:

1. Double click on **Setup.exe** to initiate the installation.
2. Click the **I accept the terms of the licensing agreement** radio button and then click **Next**; as is shown in the figure below.

The Licensing Agreement page of the installer.



3. Enter your name and your company's name in the User Name and Company Name text boxes.
4. Click on either the **Anyone who uses this computer (default)** or the **Only for me** radio button to set ScheduleWorX's access rights; then click **Next**.

The Customer Information page of the installer.



ICONICS ScheduleWorX32 - InstallShield Wizard

Customer Information
Please enter your information.

User Name:
Valued Customer

Company Name:
My Company

Install this application for:

☒ Anyone who uses this computer (all users)

☐ Only for me (Employee)

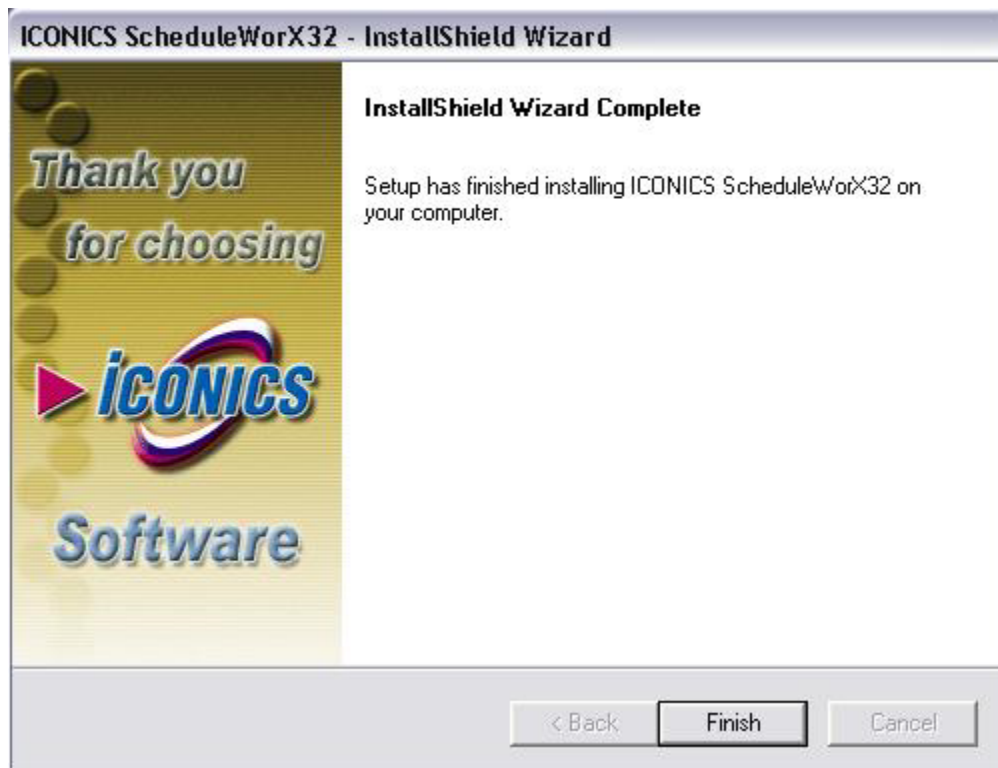
InstallShield

< Back Next > Cancel

5. Either accept the default **Complete** installation, or click Custom to select only the components you desire; then click the **Next** button.
6. **Confirm** the installation on the Start Copying File page by clicking the **Next** button.

When the installation is complete the installer page shown below is posted.

The Installation Complete page of the installer.

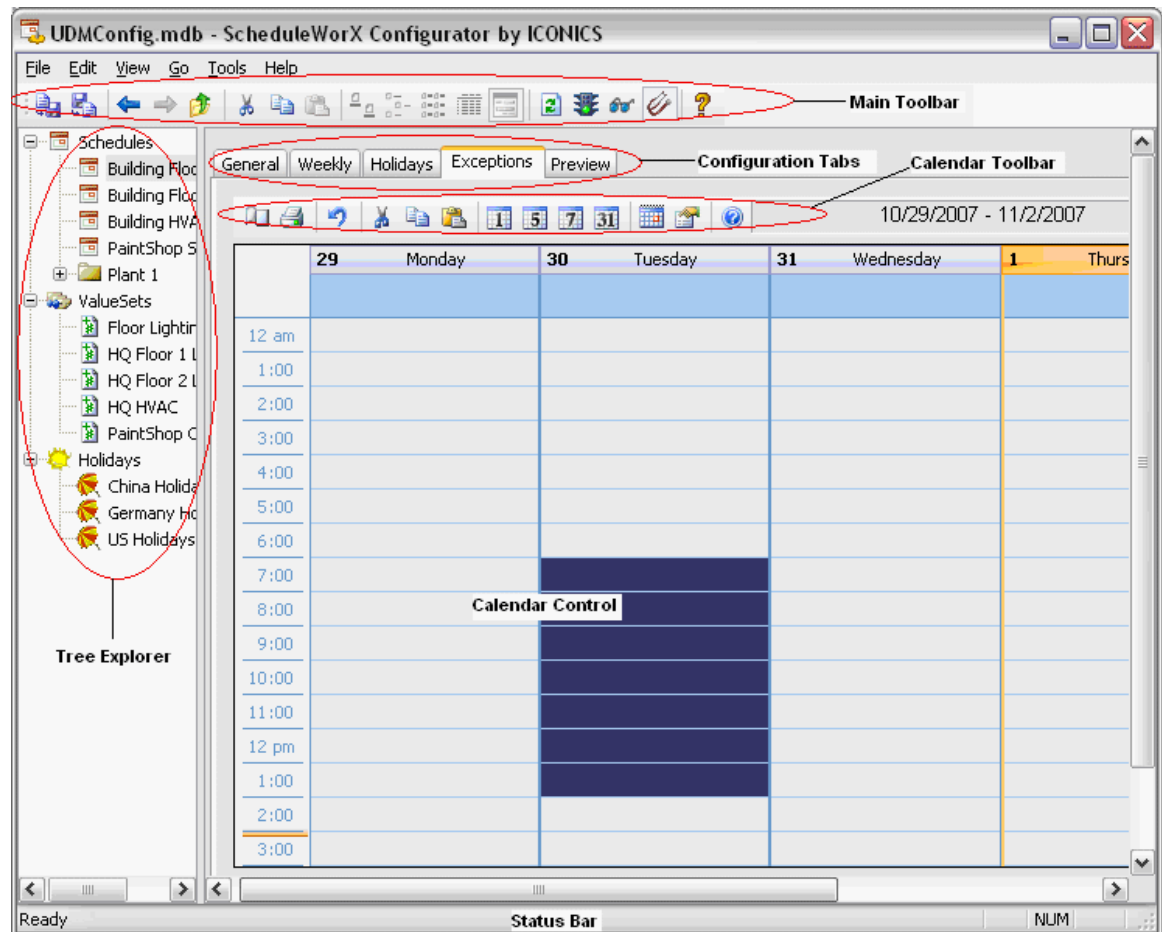


The User Interface

Nearly all of the work creating schedules, attaching those schedules to resources, defining holidays, and setting up exceptions is done within the ScheduleWorX32 Configuration user interface (shown below). The notable features are the Main toolbar, the Tree Explorer, and the main panel where you enter properties for items or view the Calendar.

The five tabs that you see in the figure below are shown when a schedule item is selected. ValueSets and Holidays display different tabs and ask you to enter different properties.

The ScheduleWorX32 User Interface in the Five Day view.



Main Toolbar

The Main toolbar (shown below) can be docked to the top, bottom, right, or left of the ScheduleWorX32 window, or can float as a resizeable toolbar at any position you desire.

To view/hide the Main toolbar:

Click on the View menu, Toolbars, then Main select the Toolbar command.

Main Toolbar



The toolbar has the following features:

- Import/export configuration data
- Navigate left, forward, back, or up in the tree control
- Perform clipboard operations
- Change the view of the list window
- Refresh the contents of the entire window
- Turn Runtime mode on and off
- Turn on/off the Monitor view pane to view schedules currently in effect
- Turn on/off the Diagnostic view pane to display various reports such as showing all defined schedules, or those that are disabled
- Open application About box

The specific buttons on the toolbar are described in more detail in the table below.



Import button. Imports configuration data from a CSV file (TXT, or other delimited separated value file) from an export file created by ScheduleWorX32.



Export button. Export configuration data to a CSV file (TXT, or other delimited separated value file). You can use export files as backups, transfer files, or source of ScheduleWorX32 configuration data in another instance of ScheduleWorX32.



Back button. Moves to your previous selection in the Tree Explorer; the function works similarly to the Back button of a browser. The keyboard equivalent for this command is Ctrl+Alt+Left Arrow.



Forward button. Moves to the next selection in the Tree Explorer; the function works similar to the Forward button of a browser. The keyboard equivalent for this command is Ctrl+Alt+Right Arrow.



Up One Level button. Move to the next folder up in the Tree control.



Cut button. Moves a selection onto the Clipboard, deleting the source. The keyboard equivalent for this command is Ctrl+X.



Copy button. Moves a selection onto the Clipboard, without deleting the source. The keyboard equivalent for this command is Ctrl+C.



Paste button. Places the contents of the Clipboard at the current position. The keyboard equivalent for this command is Ctrl+V.



Large Icons button. Shows the contents of the List View using large icons. The keyboard equivalent for this command is F7.



Small Icons button. Shows the contents of the List View using small icons. The keyboard equivalent for this command is F8.



List button. Shows the contents of the List View using small icons in a concise list. Item properties are not shown. The keyboard equivalent for this command is F9.



Details button. Shows the contents of the List View using small icons and a listing of the item properties. The keyboard equivalent for this command is F10.



Dialog View button. Shows an item with the detailed view of all its properties. The values in the Dialog View are editable.



Global Refresh button. Queries the database and retrieves all stored configuration data, then refreshes all portions of the screen with current values. The keyboard equivalent for this command is F5. If you want to refresh the Tree control, press the Shift+F5 keystroke, which is the Subtree Refresh command.



Start / Stop ScheduleWorX32 button. Toggles ScheduleWorX32 into and out of runtime mode.



Monitor View button. Opens the Monitor pane at the bottom of the application window where you can observe live values currently in effect. You can also invoke schedule overrides or clear existing overrides by right clicking on an item and selecting a context menu command. The keyboard equivalent for this command is F12.



Diagnostic View button. Opens the Diagnostic pane at the bottom of the applications, and shows you a report of all configured schedules. You can select separate reports to show just enabled/disabled schedules or just current event information.

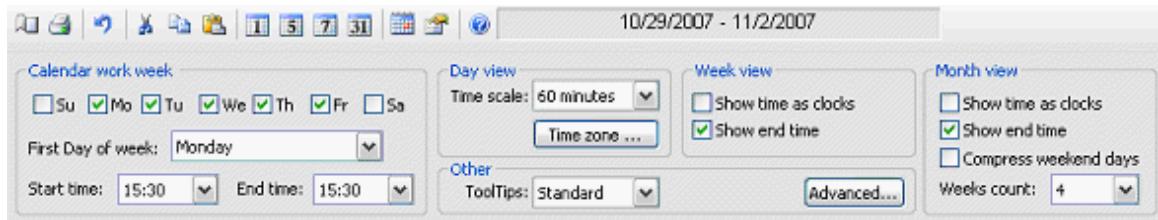


About button. Opens the About dialog box.

Calendar Properties Toolbar

The Calendar Properties toolbar allows you to set the options and properties of schedules. As you create schedule and events you can alter your view of the Calendar control by setting the number of days in your current view and even displaying or hiding days of the week in the Calendar work week section. The Day, Week, and Month view sections allow you to change the number of time periods that the calendar displays.

Calendar Properties toolbar displayed in the full view.



Print Setup button. The Print Setup button allows you to set print options such as page size, orientation, and more prior to printing your calendar.



Print button. Click this button to open the Windows Print dialog box and print your calendar.



Undo button. Click the Undo button to discard any changes made to your schedule since the last time the schedule was changed. The keyboard equivalent for this command is Ctrl+Z.



Cut button. This button is the standard Windows Cut command. The keyboard equivalent for this command is Ctrl+X.



Copy button. This button is the standard Windows Copy command. The keyboard equivalent for this command is Ctrl+C.



Paste button. This button is the standard Windows Paste command. The keyboard equivalent for this command is Ctrl+V.



One Day View button. The One Day View button changes the calendar control so that you see a single day in the control.



Five Day View button. The Five Day View button changes the calendar control so that you see a five day work week in the Calendar control.



Seven Day View button. The Seven Day View button changes the calendar control so that you see a seven day week in the Calendar control.



One Month View button. The One Month View button changes the calendar control so that you see an entire month in the Calendar control.



Date Picker button. Click on this button to open the Date Picker control. This pop up calendar displays four months at a time and allows you to navigate quickly to the date that you want to view in the Calendar control.



Properties Toolbar button. Use this button to toggle the Calendar

Properties toolbar between show and hide.



About button. Click this button to open the application About dialog box.

To display the Calendar Properties toolbar in its compact view:

Click on the Properties button

To display the Calendar Properties toolbar in its full view:

Click on the Properties button

Calendar Properties toolbar in the compact view.



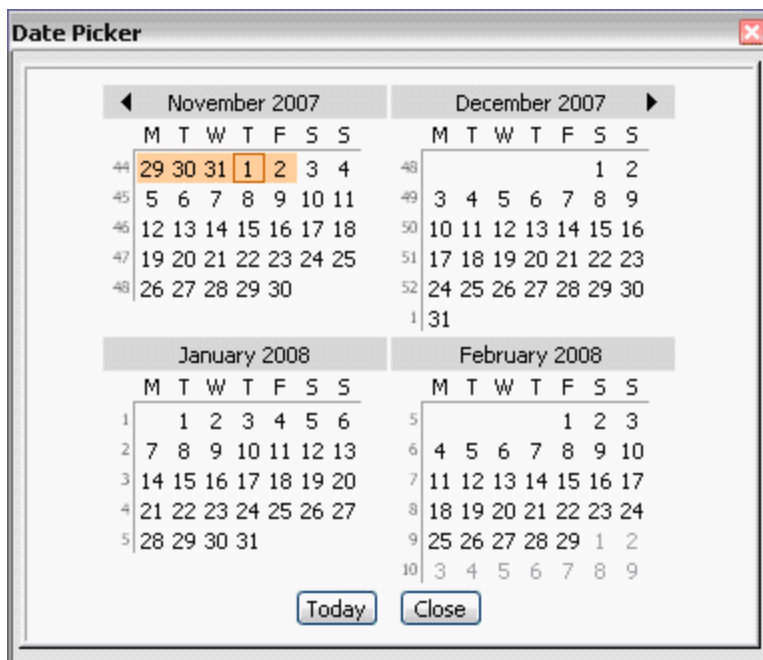
Date Picker

The Date Picker control allows you to move quickly through the calendar months and years and select a date of interest to view in the Calendar control. Dates with scheduled events are bolded in the Date Picker.

To view the Date Picker:

Click on the Date Picker button; the four month Date Picker appears as shown below.

The Date Picker control.

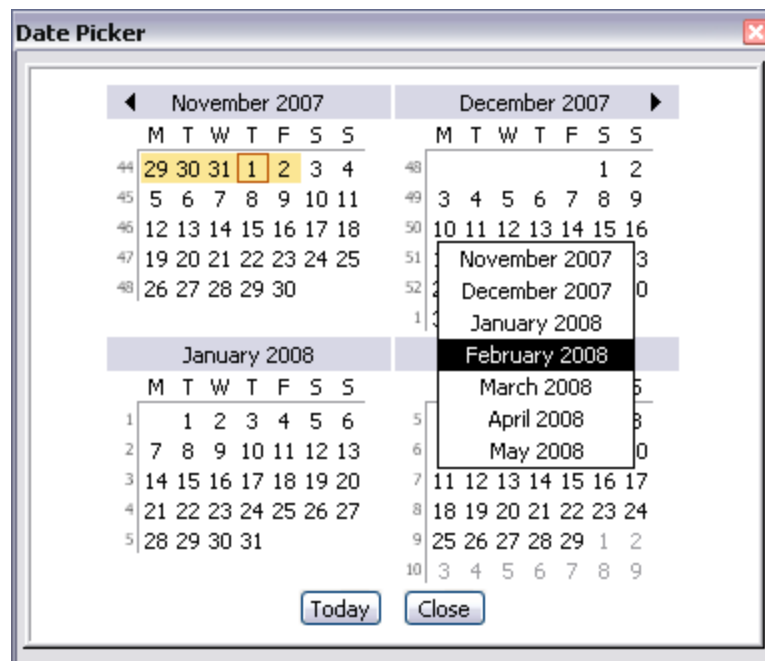


The Date Picker can be navigated using the following actions:

- To directly **select a date** in view...click on that date
- To **move forward, back, up or down through the days**...use the right, left, up or down arrow keys, respectively.

- To **select today's date**...click on the Today button.
- To move to the **first or last day of the week**...press the Home or End keys, respectively.
- To move to the **first or last day of the month**...press the Ctrl+Home or Ctrl+End keystrokes, respectively.
- To select a **range of days** viewed in the Calendar control...click on the first or last day of the range, hold the Shift key and press the Right or Left arrow key, respectively.
- To **move forward or back** through the months...click on the Left Arrow (or Page Down) key; and the Right Arrow (Page Up) key, respectively.
- To move quickly through the **next or last three months**...click and hold the mouse button on the month name and select the month name from the popup menu. The figure below shows a sample month menu.

The Month pop-up menu.



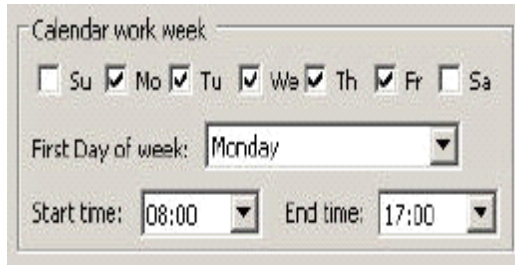
- To **close the Date Picker**...press the Alt+F4 keystroke, the Escape key, click the Close button, or click on the close box in the toolbar.

The Date Picker also exists in various places as a single month sized pop up, with the same operational characteristics.

Calendar Work Week

This Calendar work week section settings shown below apply only if you are viewing the Calendar work week. They do not appear when you are setting event properties.

The Calendar Work Week section.



Calendar work week

☐ Su ☒ Mo ☒ Tu ☒ We ☒ Th ☒ Fr ☐ Sa

First Day of week: Monday

Start time: 08:00 End time: 17:00

Enable the check box(es) to display or hide individual days: Su, Mo, Tu, We, Th, Fr, and Sa weekdays in your calendar. Disable the check box to hide that day from view. ScheduleWorX32 resizes the days in view to give each day more room when a day is hidden from view.

Note: Runtime operations of the schedules you create are not affected by the state of any day's check box; this is a view only feature.

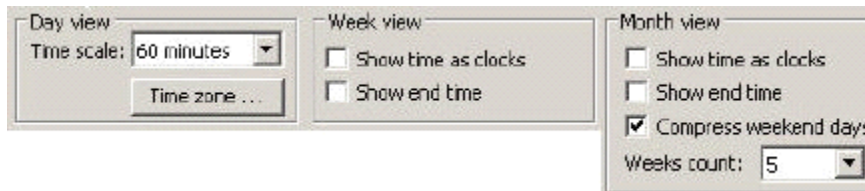
The First day of the week list box selects the day that appears in the left-most column in the display.

The Start time and End time list boxes alter the highlighted portion of the workday. These settings only affect the color displayed during these time periods, and nothing more.

Day, Week, and Month Views

Most of the settings in the Day, Week, and Month Views alter the number of time periods that are displayed in the Calendar control. This section of the Properties Control toolbar is shown below.

Day, Week, and Month Views Properties Control toolbar sections.



Day view
Time scale: 60 minutes
Time zone ...

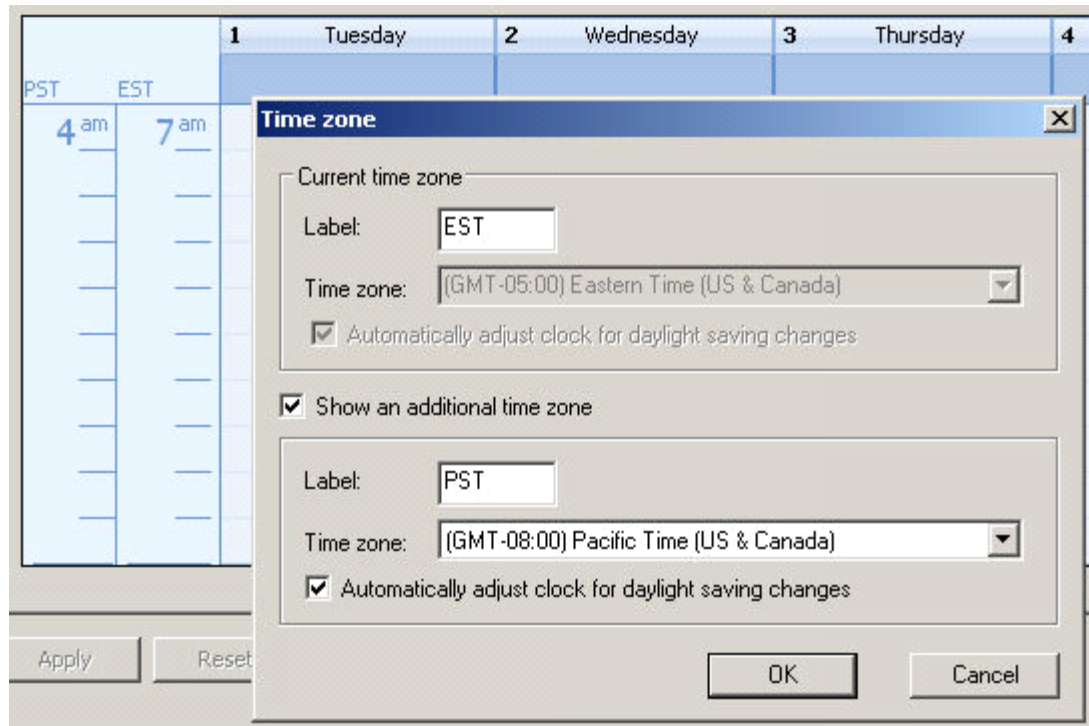
Week view
☐ Show time as clocks
☐ Show end time

Month view
☐ Show time as clocks
☐ Show end time
☒ Compress weekend days
Weeks count: 5

The Day view section settings apply to the One Day or Work Week views only. In the Time scale list box you can controls the size of the time periods displayed in the calendar from a list box. Time scale selections possible are: 5 min, 6 min, 10 min, 15 min, 30 min, and 60 min.

The Time Zone button opens the Time Zone dialog box shown below. The Current time zone takes as its value the time zone selected by your operating system as part of your Date and Time control panel setting. The only thing you can modify with the Current time zone is the Label.

Time Zone dialog box.



You have full control over the value and label of the second time zone.

To show a second time zone:

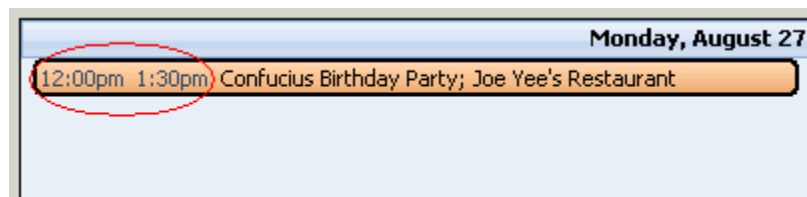
1. Enable the Show an additional time zone check box.
2. Enter a **label** for the time zone in the Label text box.
3. Select the **desired time zone** from the **Time zone** list box; it can be any time zone from the global list.
4. If the secondary location observes daylight saving time, click the **Automatically adjust clock for daylight saving changes** check box.
5. Then click **OK**.

When you have two times zones displayed each time zone is shown in the Time Scale, one next the other. The figure above shows the two time zones at the left side of the calendar control.

The Week view and Month view has additional options, as follows:

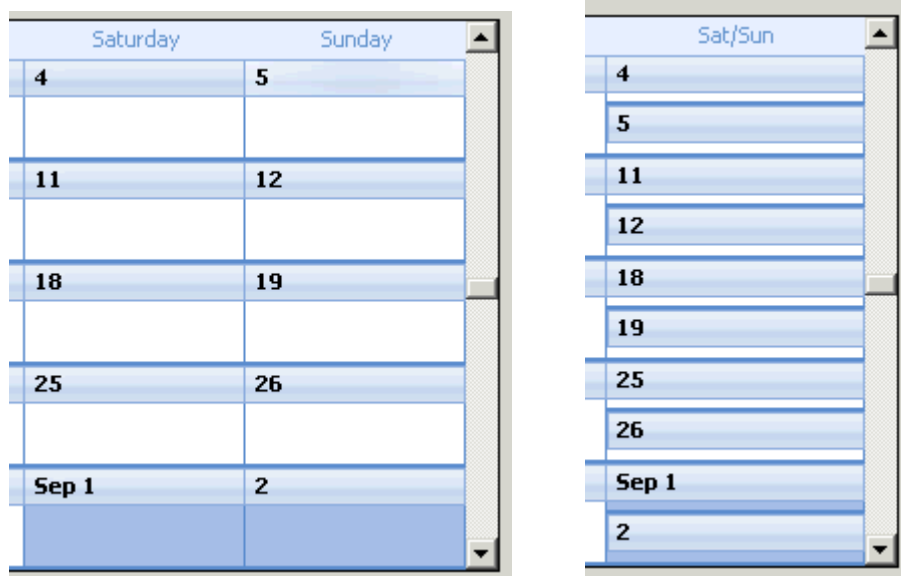
- **Show Time as Clocks.** This option (week and month views) shows the start/stop times as analog clock icons.
- **Show End Time.** This option (week and month views) displays the end time of an event.

An event showing the end time.



In the month view you have an option to compress weekend day or not. The figure below illustrates the difference between uncompressed or Expanded and Compressed weekend days.

Expanded (left) vs. Compressed (right, default) weekend days.



The month view lets you set the number of weeks in a month as part of the Weeks Count. This list box changes the number of weeks displayed in the Month view. You can choose from values between two and six weeks to display in the Month view.

Other Toolbar Options

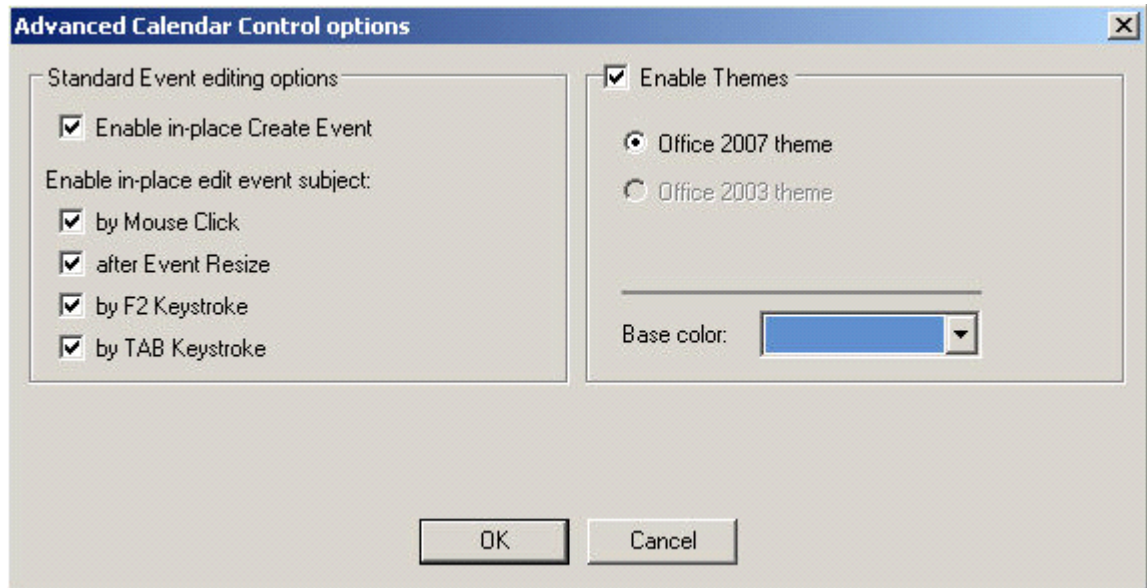
The Other section of the Properties Control toolbar allows you to turn ToolTips on or off, and to set other advanced options. This section is shown below.

The Other section.



Use the ToolTips check box to enable or disable tooltips throughout the Calendar control. The Advanced button opens the Advanced Calendar Control dialog box shown in the figure below.

Advanced Calendar Control dialog box.



Features available in the Advanced Options dialog box include:

- **Enable in-place Create Event.** The enabled (the default) setting creates an event in the selected cell when you start typing. When disabled typing into a selected cell does not create an event.
- **Enabled in-place edit event subject.** These settings alter the ability to edit the subject of an event by performing the operation listed in the check box.

For example, when you enable the By Mouse Click you can left click on an event and begin editing the subject. When disabled, left click on an event can only select the event.
- **Enable Themes.** This section lets you modify the ScheduleWorX32's calendar color scheme

Calendar Views

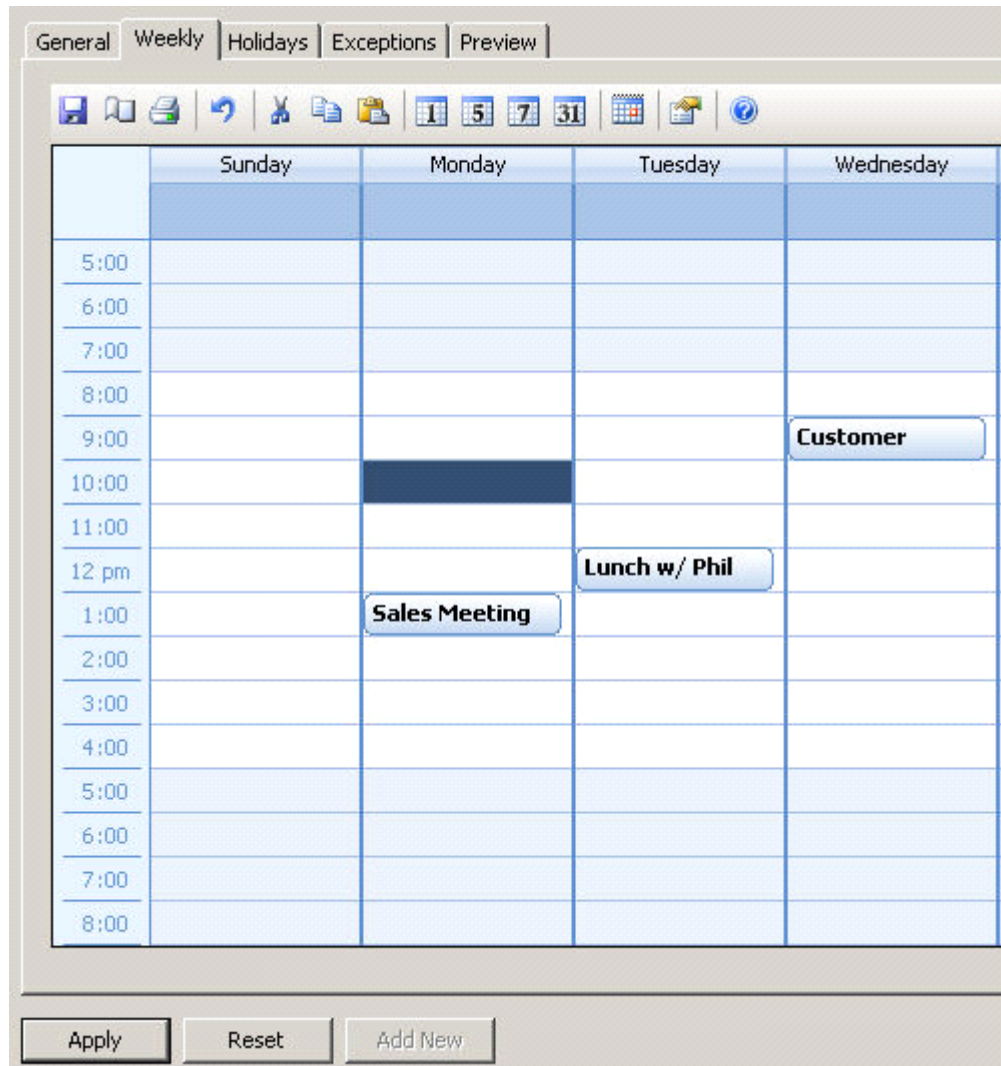
View your schedule calendars by highlighting one of the configured schedules in the Tree Explorer. Then select the type of events to view by selecting the corresponding tab in the Calendar toolbar. That toolbar has five tabs which do the following things:

- **General tab.** You use the General tab to name a schedule, and set the effective period and assign valueset which are a set of resources controlled by tags.
- **Weekly tab.** In this tab you can create, configure and delete weekly or recurring events.
Note: The Weekly tab displays a weekly calendar, but cannot be modified to show more than seven days at a time. It's main purpose is to allow you to work with **recurring events**. You can show fewer days by altering the work week, but **the calendar is best viewed on the Preview tab**.
- **Holiday tab.** On this tab you can pick a holiday schedule and assign different holiday events to the different schedules. Holiday schedules are defined with the Holiday node of the Tree Explorer. You can see any holiday that is in your current week on the Weekly schedule, but you can see all of your holidays on the Preview tab. Holidays show up on the calendar as green events.
- **Exceptions tab.** Exceptions are scheduled events that override both weekly and holiday events. Exceptions can recur or be defined as a one time event and show up on the calendar as red events. You can use exceptions to create events that recur on a daily, weekly, monthly or yearly basis.
- **Preview tab.** This tab shows all weekly events, holidays, and exceptions that were defined for the date in view.

Weekly View

The Weekly View displays the work schedule. It allows you to set recurring weekly events, and displays a calendar for your to configure events that will reoccur every week. You have control over the number of days in the week (up to 7) in view, and what days are shown for that week. This calendar shows just one work week, views for the current day, seven day week, or month cannot be displayed in this view and need to be viewed on the Preview tab.

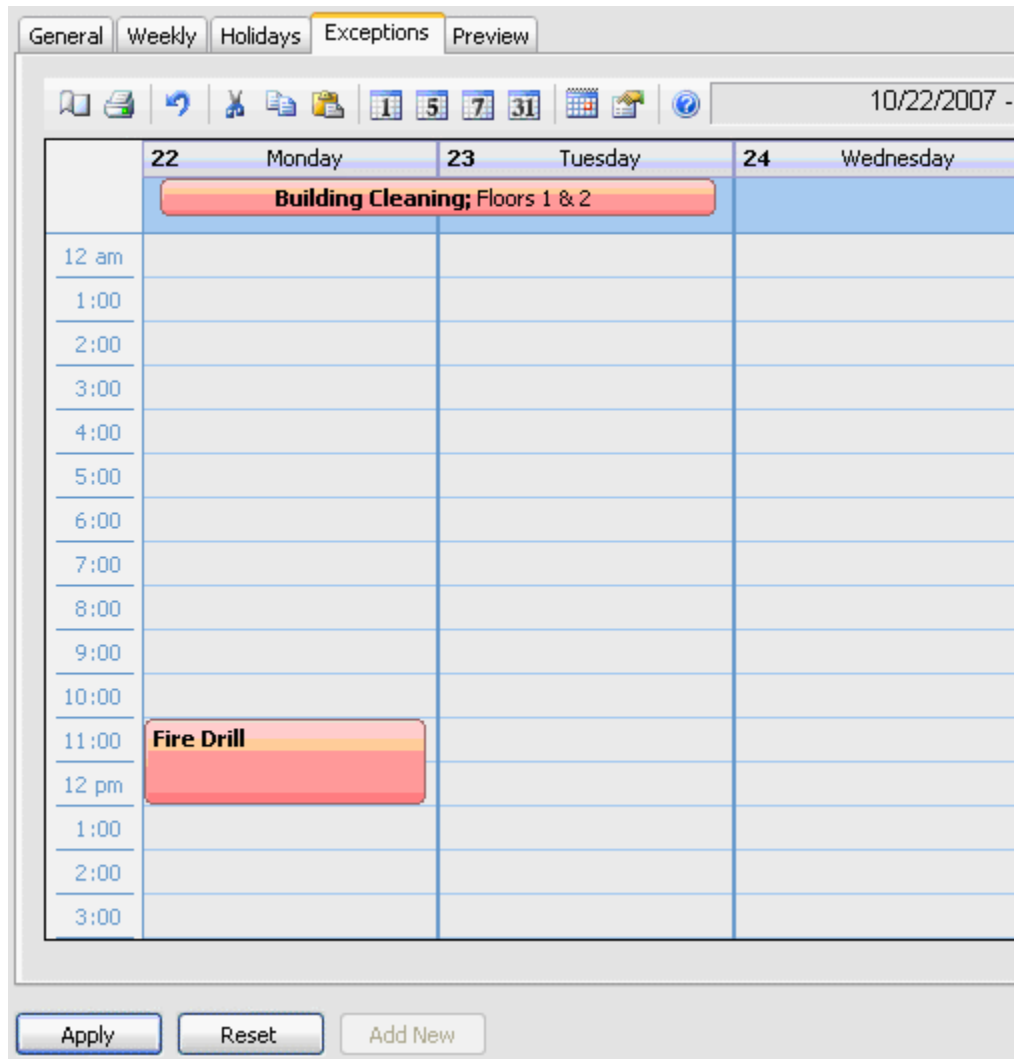
Weekly View



Exception View

The Exception tab is capable of displaying a calendar in the 1, 5, 7, or monthly views. The primary use of the Exception tab is to create events that takes precedence over scheduled events already defined, and to create recurring events that have patterns other than weekly. As shown in the figure below an exception event is marked in red. When an exception takes place at the same time as a scheduled weekly or holiday event the exception takes precedence. Only an override takes precedence over an exception.

Exceptions Tab



Preview View

Use the Preview View as the primary calendar display for operators.

The Preview tab displays the Calendar for all possible time periods. You can't configure or create new events in this view, which makes it safe to display for an operator viewing the calendar on their monitor. With the user of ICONICS Security, the modification rights can be revoked from all views. Weekly events, exceptions, and holidays all appear on this view. The Preview view is shown below in the weekly view.

Preview View

General Weekly Holidays Exceptions **Preview**

10/22/2007 -

Monday, October 22

- [Exception] Building Cleaning; Floors 1 & 2
- 11:00am 1:00pm [Exception] Fire Drill
- 1:00pm 2:00pm [Weekly] Sales Meeting

Tuesday, October 23

- [Exception] Building Cleaning; Floors 1 & 2
- 12:00pm 1:00pm [Weekly] Lunch w/ Phil

Wednesday, October 24

- 9:00am 12:00pm [Weekly] Customer Visit

Schedules

Schedules are a container objects for events. A schedule can contain one event or it can contain many events. Schedules exist to control resources, and resources are anything that is controlled by an OPC tag(s).

A schedule must have a valueset assigned to it, and the valueset in turn must be associated with one or more tags. The values in the valueset control the state or condition that is passed by the event to the OPC tag.

Schedules can be defined so that they have a start time and a stop time; or they can be open ended. Schedules can be duplicated and modified, but the name for a schedule must be unique in the folder that it is in. There are no program limits to the number of schedules you can define, or the number of events in a schedule although inserting many events into a calendar means that it will require more time to draw the calendar.

You can import and export schedules.

Create a Schedule

You create a schedule either by right clicking on the folder you wish to create the schedule in and selecting the Schedule command from the New submenu, or by using the same submenu found on the Edit menu. The best way to manage schedules is to create a folder for each set of resources you wish to manage. Then you can place all of the schedules that you create for that group of resource in that folder. This organizational scheme is the best way to view your schedules as a group in the Monitor View, or to determine which of the schedules you have defined are running and which aren't in Diagnostic View.

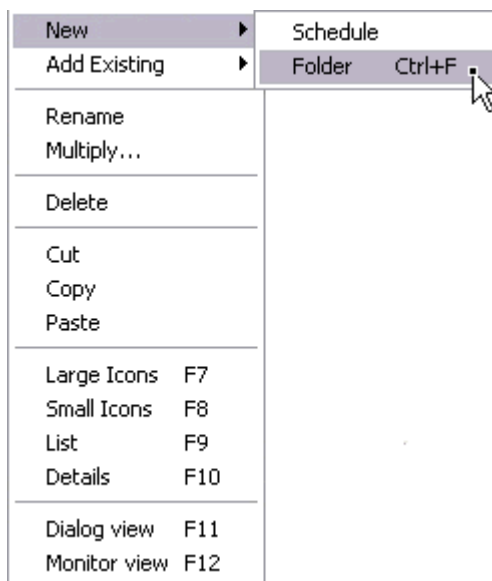
Create a Schedule Folder

Schedules are organized into folders, so that a set of schedules for similar resources can be grouped together and more easily found. You can create a folder at any level in the Schedule tree, and if desired you can drag and drop a folder in the tree to move a folder within the hierarchy. Folder names are editable in the Name text box in the Details pane of the Schedule window (lower right pane).

To create a **new folder**, do the following:

1. Right click on the location in the Schedule tree where you want the folder to be created, then from the **New** submenu select the **Folder** command (Ctrl+F) as shown in the Figure below.

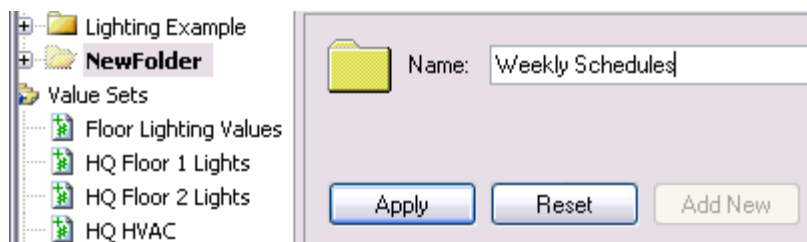
Or, click the **File** menu, then from the **New** submenu select the **Folder** command

The New Folder command.

2. Enter the **name** of the new folder into the Name text box as shown below.
3. Click the **Apply** button.

The folder is added to the tree control below the folder that was selected prior to issuing the command.

Creating a new folder.



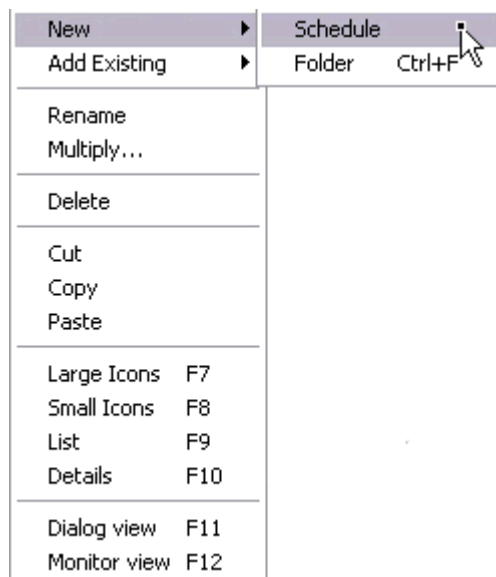
Create a New Schedule

You create a schedule and attach that schedule to an OPC tag to control a resource or set of resources. Just like a folder that contains schedule(s), a schedule contains schedule item(s) or timed events. A schedule item is the action or event that you are programming in your schedule.

To create a new schedule, do the following:

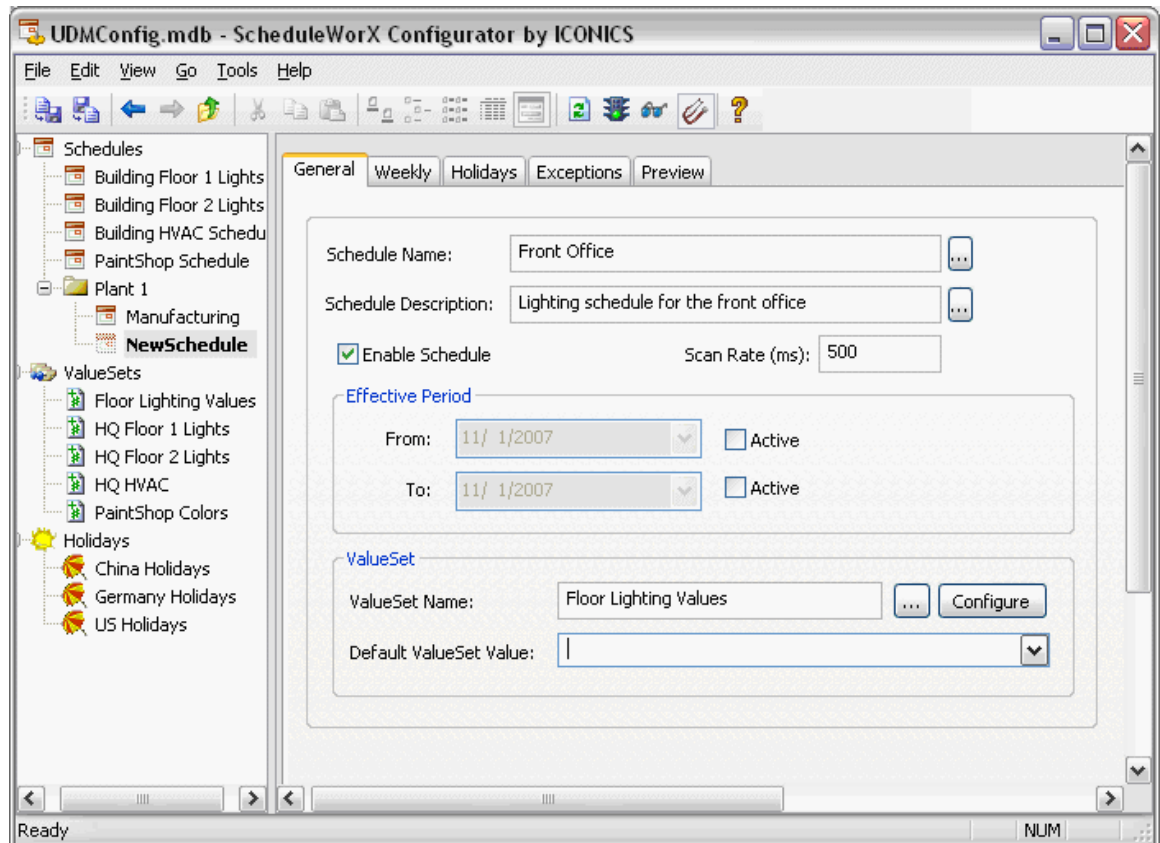
4. Right click on the folder you want to create the schedule in, then from the New submenu select the command as shown in the Figure below.

The New Schedule command.



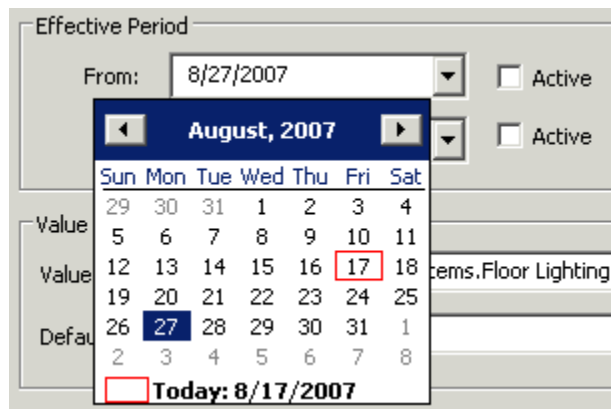
5. Enter the name of your schedule into the Schedule Name text box, as shown in the figure below.

The General tab is where you set the basic schedule properties.



6. Enter the information you desire into **Schedule Description** check box (optional)
7. Set the status of the schedule in the **Enabled Status** list box to either enabled or disabled.
8. Set the **Effective Period** start in the **From** and **To** combo box either by directly entering the date, or by clicking on the combo box and selecting the date from the one month Date Picker shown below.

Use the one month Date Picker to move quickly to dates you wish to use for the From and To combo boxes.



9. To save a schedule click the **Apply** button at the bottom of the window.

Schedule Configuration Tab

The Schedule Configuration tabs is the main control used to create and assign properties to schedules. When you select a different type of item from the ScheduleWorX32 Tree Explorer such as ValueSet or Holiday you see a different set of property tabs.

For schedules the configurator displays the five following tabs:

- **General tab.** You use the General tab to name a schedule, and set the effective period, assign a valueset, and set a default value. The General tab is the only tab that is required to save a schedule to the database.

The three tabs that follow allow you to create events that will be part of your schedule.

- **Weekly tab.** Create, configure and delete weekly events on this tab. Events defined on this tab repeat on a weekly basis.
- **Holiday tab.** On this tab you can pick a holiday schedule and assign different events to the different schedules. Holiday lists and the holidays that they contain are defined with the Holiday node of the Tree Explorer.
- **Exceptions tab.** Exceptions are scheduled events that override both weekly and holiday events. Exceptions can recur or be defined as a one time event. If you need to create a one time event, then this tab is where you would create it.

The last tab is a read-only view of all events:

- **Preview tab.** This tab shows all weekly events, holidays, and exclusions that were defined for the date(s) in view. You can print your full schedule from this tab, but you cannot create new events on this tab.

General Tab

The General Tab appears when you create a new schedule or double click on an existing schedule to modify the schedule. The General tab is the only tab of a schedule that must be properly filled in with required data. To save a Schedule you must:

1. Give it a **unique name** from any other schedule in its folder.
2. Enable or disable the **Enable Status** (you can set this later on). Disabled schedules will not run, or use the default value, nor can you override a disabled schedule.
3. **Scan Rate** is used to adjust the rate at which values are propagated to the underlying OPC tags. This can be used to reduce load on the OPC server. Please note that when an event changes state or is overridden, the new event will be shown immediately in the monitor and diagnostic modes, but the values may not have yet been written to the OPC tags if the scan rate is slower.
4. Set an effective period **From** and **To** date fields. These dates set the boundary of the start and stop times for a schedule and only take effect if you click the Active check boxes next to them. If the current date is outside of the effective period then the schedule will behave the same as if it is disabled.

A schedule must have a ValueSet assigned to it, which is the list of all values that can be passed to the OPC tags. You cannot save a schedule that doesn't have a valueset defined.

The default value in the Default Value Set Value is the value that is applied to the tags when no event is active.

General Tab

The screenshot shows the 'General' tab of the GENESIS32 ScheduleWorX32 configuration window. The window has a tabbed interface with 'General', 'Weekly', 'Holidays', 'Exceptions', and 'Preview' tabs. The 'General' tab is active. It contains the following fields and controls:

- Schedule Name:** A text box containing 'Front Office' and a browse button (...).
- Schedule Description:** A text box containing 'Lighting schedule for the front office' and a browse button (...).
- Enable Schedule:** A checked checkbox.
- Scan Rate (ms):** A text box containing '500'.
- Effective Period:** A section containing:
 - From:** A date picker showing '11/ 1/2007' and an 'Active' checkbox.
 - To:** A date picker showing '11/ 1/2007' and an 'Active' checkbox.
- ValueSet:** A section containing:
 - ValueSet Name:** A text box containing 'Floor Lighting Values', a browse button (...), and a 'Configure' button.
 - Default ValueSet Value:** A dropdown menu showing 'All On'.

Monitor View

The ScheduleWorX32 user interface lets you create Schedules, events that are part of those schedules, and attach those events to valuesets to control resources. Once you have the schedules you want to enforce you should turn on the ScheduleWorX32 runtime mode. To turn on ScheduleWorX32 runtime:

Click on the Traffic Light icon in the Main toolbar.



When the traffic light is red the service is off.



When the traffic light is green the service is running.

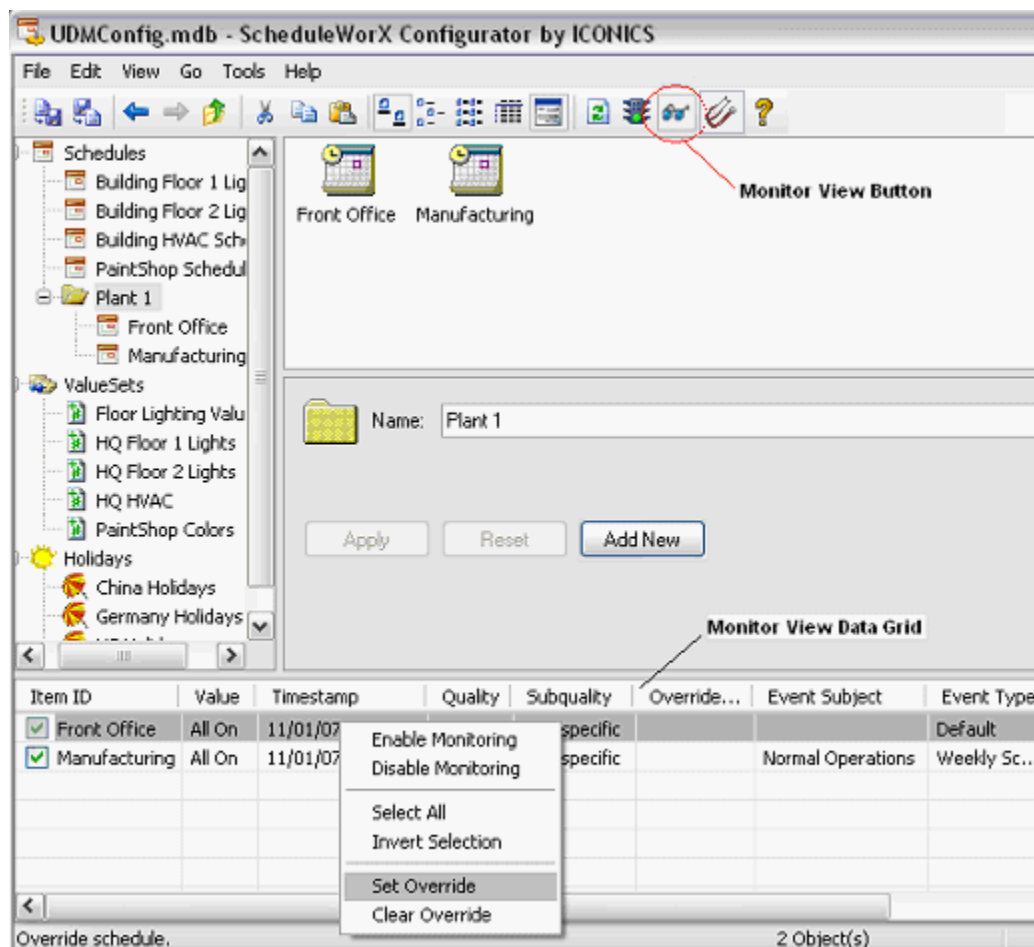
The runtime module for ScheduleWorX32 is the Unified Data Manager's runtime, UDMRuntime.EXE, as you can see when you examine the Windows Task Manager.

In order to determine which schedule is currently in force turn on the Monitor View. In Monitor View you see a data grid at the bottom of the window that displays all of the schedules that are in your currently selected folder.

To enter Monitor View:

1. Click on the **Monitor view** icon in the Main toolbar.

Monitor View in runtime.



2. To see the current values click on the **Schedule Item** check box, which enables monitoring.

Items that aren't being monitored may still be active as part of the schedule, and you need to enable monitoring on an item by item basis to determine this.

Along with the schedule names (Item ID) the grid shows their current Value and if the data Quality is good, bad, or in rare instances uncertain. The Quality value is based on the OPC definition for data quality, so that if you turn off runtime the Quality changes to Bad from Good.

Schedule Quality is Bad when runtime is turned off.

Item ID	Value	Timestamp	Quality	Subquality
☒ Manufacturing	Process 1	08/16/07 14:57:37.296	Bad	Out of Service
☒ Post Process	Bank 1 Generator	08/16/07 14:57:37.312	Bad	Out of Service
☒ Preprocessing	Bank 3 Generator	08/16/07 14:57:37.328	Bad	Out of Service

Additional event information is shown in the monitor view if you expand your display or scroll to the right. The information in these columns is as follows:

- **Override Until.** This column will tell show how long an override command is in effect, by showing what time it expires. If this time is in the past, then the override has already expired.
- **Event Subject.** This column shows the name of the current event if any is active. Note that this is not the same as the Value of the event. Also notice in the image below that overrides and default values do not have an event subject.
- **Event Type.** The event type will display the type of event that is currently active. Possible options are Default, Weekly, Holiday, Exception, and Override.

Next Event Information: The following information all pertains to the next scheduled event that will run after the current event completes, or become active during the current event if the next one has a higher order of precedence. The application will only look one year into the future to find the next event, and if none is found in that time range, then a date one year from the current date will show up as the Next Event Time. If the current event is actually the default value, or there is no event at all, then the next event will be the first event to become effective from this point forward. When there is currently an override with no end, it will not show a next event.

- **Next Event Time.** This column will show the time that the next configured event will begin, if any is configured.
- **Next Subject.** The next subject will display the subject of the next event, if any is found. If there is a gap before the next event, resulting in the default value or no value, then the next subject will be blank.
- **Next Value.** The next value will show the value of the next event to take place. In the case of the next value being the default value it will still show the value here, though the subject will be blank.

Additional Information in Monitor View

Override Until	Event Subject	Event Type	Next Event Time	Next Subject	Next Value
	Lunch Hour	Weekly Schedule	11/6/2007 3:00...	Day Lights	Day
	Day Time	Weekly Schedule	11/6/2007 7:00...	Night Time	Night
		Default	11/6/2008		
11/6/2007 4:59:08 PM		Override	11/6/2007 4:59...		All Off
		Default	11/7/2007 9:00...	tomorrow	All Off
	Red Paint	Weekly Schedule	11/6/2007 7:00...	Yellow Paint	Yellow

Monitor View items have a context menu that allow you to perform two operations:

- **Enable / Disable Monitoring.** These commands are the equivalent of clicking the Item ID check boxes on and off.
- **Set / Clear Override.** An override allows you to enforce a schedule to have a certain value and is a particularly important setting to note.

Overrides

When you create a schedule it is enforced in the normal course of events. A higher priority schedule will take effect over a lower priority schedule should there be a conflict. If you define a holiday, then the events that applies to that holiday takes precedence over regular weekly events. One step further up the food chain is exceptions. When you create exception events, those exception events assigned to that exception take precedence over both a holiday and a weekly event. An Override allows you to assign a value to a schedule that overrides all other defined events. When you create an override it is put into effect as soon as possible and enforced to the period you specify. The figure below shows the precedence used in determining which schedules are in effect.

To create an override:

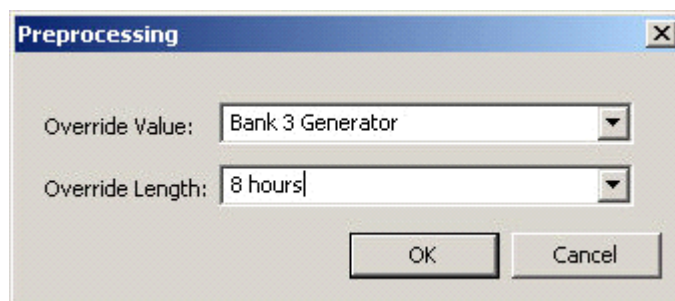
1. Right click on the **schedule name** (Item ID) in the Monitor View grid that you want to override.
2. Select the **Set Override** command from the context menu.

The Override dialog box appears, as shown below. The dialog box takes the name of the schedule name you selected.

3. Select the **value** you wish to assign from the **Override Value** list box.

This list box does not allow you to enter values that aren't currently defined in the valueset.

Override dialog box.



4. Select the time you wish the override to be enforced from the **Override Length** list box.

Or, enter the value for the override length. This list box does allow you to enter a valid time period.

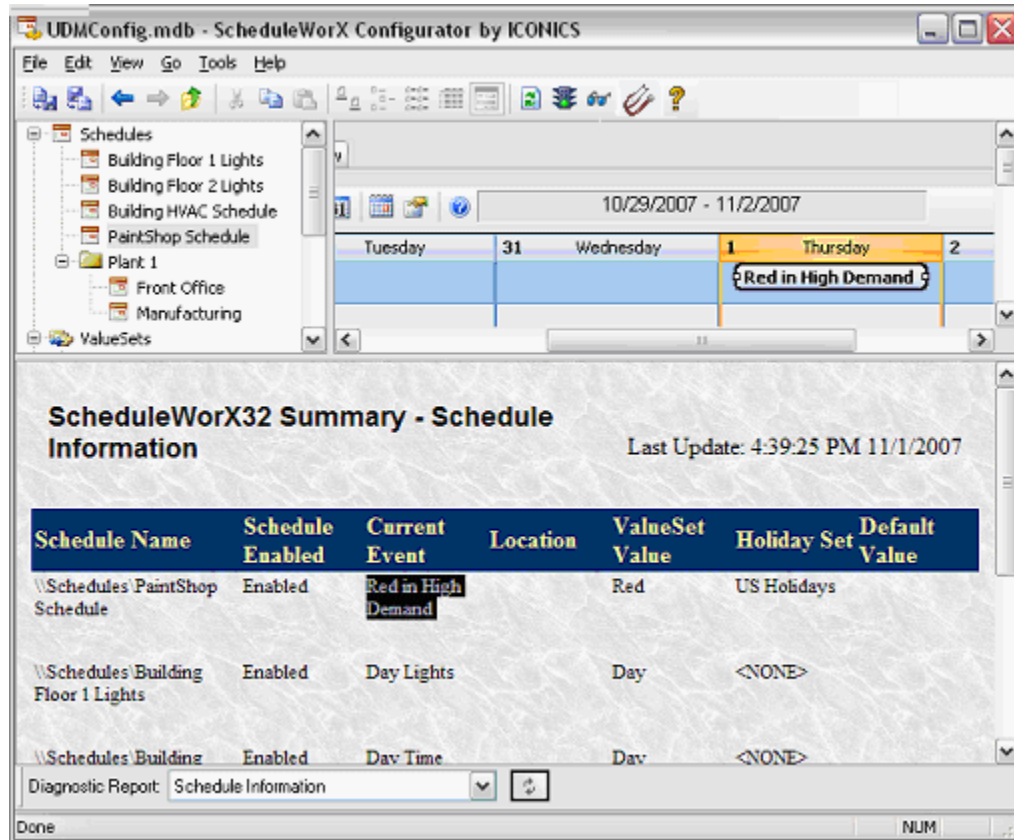
5. Click the **OK** button to enforce your override.

Overrides cannot be issued if a schedule is disabled, or if a schedule is not in the effective period.

Diagnostic View

Diagnostic View allows you to display different set of reports that show which schedules are enforced and which aren't. You turn Diagnostic View on or off by clicking the Diagnostic View toolbar button in the Main toolbar.

Diagnostic Mode showing all schedules.



Note: The Diagnostic view does not provide information about *active overrides* that are in force currently. Diagnostic view is intended to provide reports based on data stored in the schedule, and not live values. To get override information, go to Monitor view. For example, if you have an event that is an exception in Diagnostic view and you switch to Monitor view and set an override for that event, when you return to Diagnostic view you will still see the event type listed as an exception in Diagnostic view and not as override.

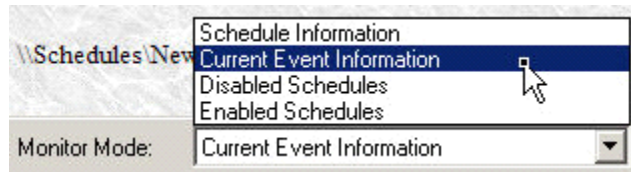
The ScheduleWorX32 Diagnostic View offers you the following reports from the Monitor Mode list box:

- **Schedule Information** displays a summary of all of your defined schedules.
- **Current Event Information** displays detailed information about the current events for each defined schedule.
- **Disabled Schedules** shows a summary view of all of the defined schedules which are currently disabled. Disabled schedules are the ones that you have disabled from the General Properties page or for which the current time is outside of the start and stop time.

- **Enabled Schedules.** Shows a summary view of all of the defined schedules which are currently enabled; that is, the Enable Status list box is set to Enabled on the General tab for the schedule.

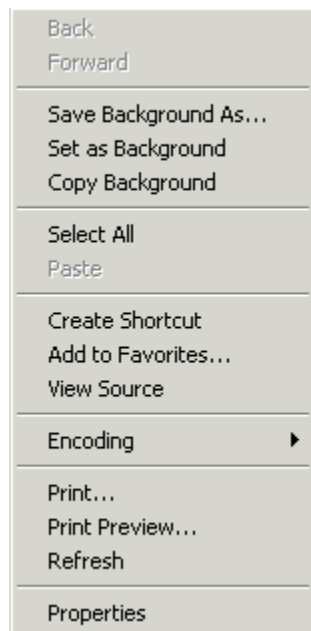
The figure below shows you the list of reports that you can display in the diagnostic view.

Diagnostic reports.



The Diagnostic panel can be resized so that it is full screen by clicking and dragging on its top border. A number of settings for the Diagnostic report can be activated from the report context menu. If you right click on a report you will see the context menu shown below.

The Diagnostic report context menu.



The commands on this menu are provided by Internet Explorer, which is used to display the report. The most useful options let you do the following:

- **Select All** selects all of the text in the report so that you can perform a copy and paste operation.
- **View Source** opens the underlying XML file that populates the Diagnostic report.
- **Encoding** lets you select the underlying language that you are using.

Note: The report is an XML to HTML translation. The commands you see in the context menu will be affected by the version of Microsoft Internet Explorer that you have installed.

- **Print** opens the Internet Explorer Print dialog box and prints your report.

- **Print Preview** opens the Internet Explorer Print Preview dialog box so that you can see what will be printed.
- **Refresh** will only reload the source from the last report, so you must instead press the Refresh button on the Diagnostic Mode status bar in order to regenerate the report and update the schedule information.

Enabling and Disabling Schedules

Schedules can get set so that they run during their effective time and are thus enabled, or they can be disabled and the scheduled events do not run.

To enable or disable a schedule:

1. Click on the **schedule name** in the tree control.
2. In the Schedule detail pane on the right click on the **General** tab if it isn't already selected.

The General Tab for a selected schedule.

The screenshot shows the 'General' tab of the GENESIS32 ScheduleWorX32 software. The 'Schedule Name' is 'Front Office' and the 'Schedule Description' is 'Lighting schedule for the front office'. The 'Enable Schedule' checkbox is checked. The 'Scan Rate (ms)' is set to 500. The 'Effective Period' section shows 'From' and 'To' dates both set to '11/ 1/2007', with 'Active' checkboxes next to each. The 'ValueSet' section shows 'ValueSet Name' as 'Floor Lighting Values' and 'Default ValueSet Value' as 'All On'.

3. Check the **Enable Schedule** checkbox if you want the schedule to be active and events to be applied, or uncheck the box if you want the schedule to be inactive and have no events applied.

You can set a bounding condition so that a schedule that is enabled become active on a certain date or so that a schedule ceases to be active after a certain date. If these options aren't set then there is no bounding condition and an enabled schedule will be applied to start immediately or not to end.

To have a **schedule start** on a particular day:

4. **Enable** the **Active** checkbox for the **From** field to have the schedule **start** on that date.
5. Click on the **From** combo box and either enter the date manually or click on the down arrow and select the date from the Date Picker.

If Active check box is disabled the From date is ignored and the schedule will be active from the current time until the To date if the Active check box is enabled for that setting.

To have a **schedule end** on a particular day:

6. **Enable** the **Active** checkbox for the **To** field to have the schedule **end** on that date.
7. Click on the **To** combo box and either enter the date manually or click on the down arrow and select the date from the Date Picker.

If Active check box is disabled the To date is ignored and the schedule will be active immediately, or starting at the From date if the Active check box is enabled for that setting, with no end date.

With both Active check boxes enabled the From and To dates define a range during which time the schedule runs (at runtime). With both Active check boxes disabled the date in the From and To dates are ignored and the schedule runs whenever ScheduleWorX32 is in runtime.

Edit and Save a Schedule

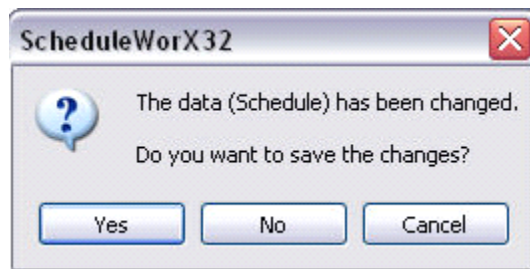
When you create a schedule and assign various properties to it such as a holiday list, specific and recurring events, and so forth you create the schedule when you click on the Apply button. The Apply button acts as a Save command. Therefore, editing a schedule is all almost identical procedure.

To edit a schedule:

1. Click on the **schedule name** in the tree control of ScheduleWorX32 that you want to edit.
2. On the **General**, **Weekly**, **Holiday**, and **Exception** tabs **alter the properties** and events that you wish to be part of your schedule.

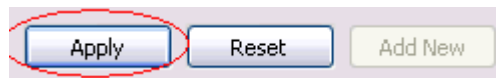
If you make a change(s) to a schedule ScheduleWorX32 will prompt you to save those changes should you try to from the schedule to another schedule, holiday list, valueset, and so forth. ScheduleWorX32 posts the alert dialog box shown below.

ScheduleWorX32 Save Changes alert box.



3. Or, to force an altered schedule to be saved click the **Apply** button.

Use the Apply button to save any changes to a schedule.



ScheduleWorX32 does not autosave any changes you make. You are physically required to save your changes.

Holidays

Holidays and other special events that are handled in the same manner are events that take precedence over regularly scheduled weekly events. Holiday events can be one time, or they can be recurring; and you can control the time period that the holiday is booked for. A holiday can be a full day, half day, or just a hour, as you require. Holidays can recur. They can be set to recur on a daily, weekly, monthly, or yearly basis; and they can recur on any day of a month (third Thursday in November) or any date in a month (December 25th).

Although holidays can recur on a daily or weekly basis, such events are better defined as weekly events since that is the lowest priority.

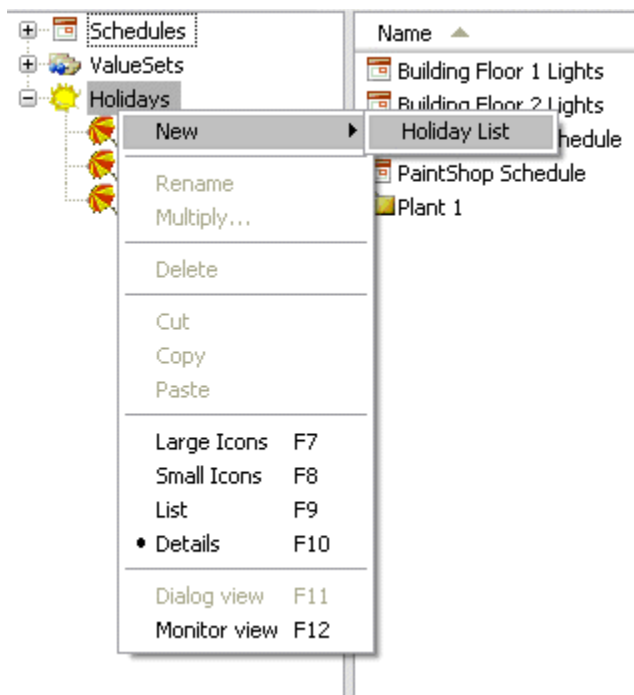
Holiday Lists

Holidays are organized into lists. Lists are usually country specific, but they can be organized however you wish. You create a holiday list by inserting holiday dates into the calendar control. Once the holiday list is created you can apply that list to a schedule. A schedule can have one and only one holiday list associated with it.

To create a new holiday list:

1. Click on the **Holidays** node name.
2. Right click on the **Holidays** node, then click on **New** and select the **Holiday List** command as shown below.

Create a new holiday list on the Holiday List tab using the Holidays node of the tree control.



3. Right click on the **New Holiday List** name in the tree control and select **Rename** from the context menu.
4. **Edit the name** so that the list name is one that you will recognize.
5. Click on the **Apply** button to create your new holiday list.

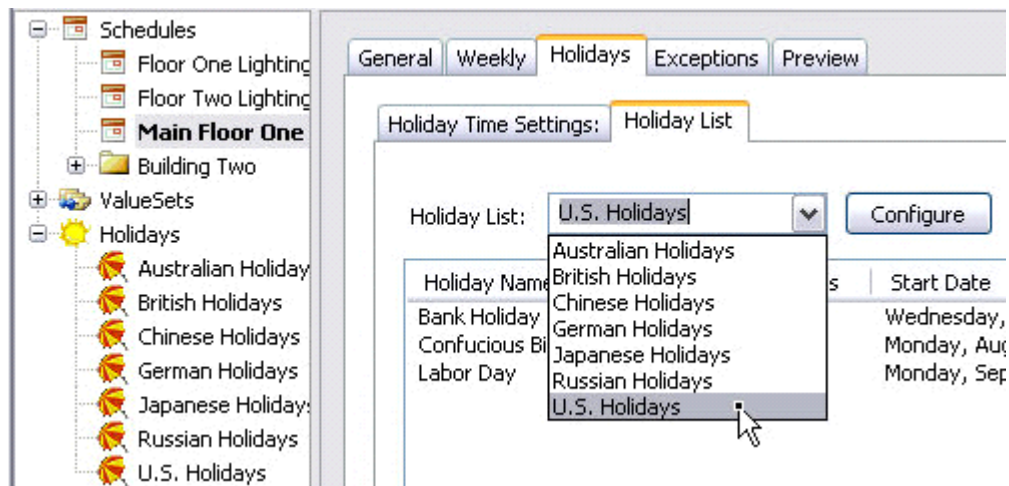
Applying a Holiday List to a Schedule

Schedules can have a holiday list applied to them. When you assign a holiday list to a schedule the holidays on that list will take precedence over any weekly scheduled events that are defined. However, exceptions still take precedence over holidays.

To assign a holiday list to a schedule:

1. Click on the **schedule name** in the tree control that you want to assign a holiday list to.
2. Click on the **Holidays** tab, and then click on the **Holidays List** tab that is part of the Holidays tab.
3. Click on the **Holiday List** drop down list box and select the **holiday** list you desire.

Select the holiday list that you want to connect with a schedule on the Holiday List tab.



4. Click on the **Apply** button to enforce your selection.

Creating a Holiday

You can only create holidays using the controls that the Holiday Lists on the tree control expose. With a holiday list selected the Calendar control allows you to define holidays that are once only or recurring. Holidays can be all day affairs, half day morning or afternoon, or some other part of the day. ScheduleWorX32 gives you granular control over the time that a holiday event occurs.

To create a holiday event:

1. Click on the **holiday list** that you want to add the holiday to in the Holidays portion of the tree control.
2. Click on the **Schedules** tab.
3. Go to the **date** that will become a holiday on this holiday list. You can use the Date Picker icon on the toolbar to move quickly about the calendar.
4. On the calendar view of the day double click on a **time period** to open the Events Properties dialog box as shown below.
5. Fill out the **Event Properties** dialog box, then click **OK**.

When you create a holiday in the holiday calendar the Event properties only allows you to apply whole day settings.

The screenshot shows the 'Event properties' dialog box with the following fields and values:

- Subject:** New Years Day
- Location:** (empty)
- Label:** None (dropdown)
- Start time:** 1/ 1/2008, 11:00:00 AM
- End time:** 1/ 1/2008, 12:00:00 PM
- All day event:** ☒
- Recurrence...** (button)
- Show time as:** Free (dropdown)
- Event Priority:** 1 (dropdown)
- Buttons:** OK, Cancel

You can define holidays that span a range of days:

1. In a calendar view **click and drag** to select the days that will be a holiday as shown in the figure below.
2. Right click on one of the selected days, then select **Add new event** from the context menu.
3. In the Event Properties dialog box you will now see two days entered into the date field, and the time fields have disappeared.

Add new event command.

22	23	24
		25
29		Dec 1
		2

Here Thanksgiving was defined as a two day event. The time fields are not shown in the Holiday Lists because you must use the Holiday Time Settings of each schedule to apply specific times to each holiday.

A two day event.

Event properties

Subject: Thanksgiving

Location: Label: None

Start time: 11/22/2007 End time: 11/23/2007

☒ All day event Recurrence...

Show time as: Free

Event Priority: 1

OK Cancel

4. Fill in the remainder of the **Event Properties** dialog box, then click the **OK** button to create the holiday.
5. To make the holiday recurring, click on the **Recurrence** button and fill out the information to daily, weekly, monthly, or yearly recurrence to the holiday.
6. Click the **Apply** button to add the holiday to your holiday list.

When you create a holiday and apply it to a holiday list, that holiday is added to the schedule of every schedule that is associated with this holiday list. Should you wish to suppress a holiday, define an exception that occurs on the same date

Holiday Time Settings

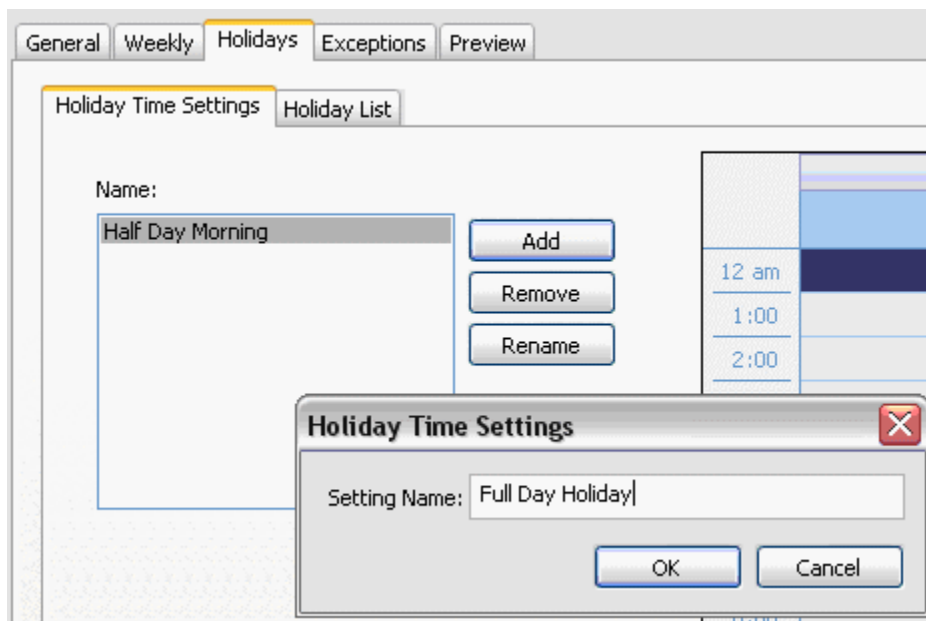
When you define a holiday that is part of a holiday list on the calendar the holiday is defined as a full day event. You can't alter this assignment in the Holiday List properties sections. However, for different schedules to use that holiday list, they will likely have different behavior because of a holiday. The Holiday Time Setting is where you can specify how a schedule defines what to do on a holiday. For example, a lighting schedule may be defined to turn just the emergency lights on for a holiday, however, the HVAC schedule for the same building may need to turn off the heat for that day. In this way, a holiday can be reused in multiple schedules to control different systems, buildings, or other resources.

To specify a specific time of the day that a holiday event begins and ends:

1. Click on the **schedule name** in the tree control that contains the holiday(s) you wish to modify.
2. Click on the **Holidays** tab and then click on the **Holidays Time Settings** tab.
3. Click the **Add** button and in the **Holiday Type** dialog box enter a name for the schedule you wish to apply; then click the OK button.

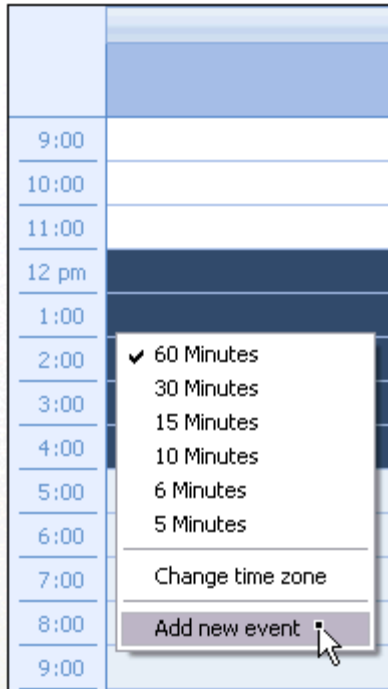
In the figure below an afternoon holiday is being defined.

Create a holiday event schedule as part of a schedule's holiday properties.



4. Double click on the **time period** you wish to use, or click and drag a time period and select the **Add New Event** command from the context menu as shown below.

Create a new holiday event schedule by selecting the time.

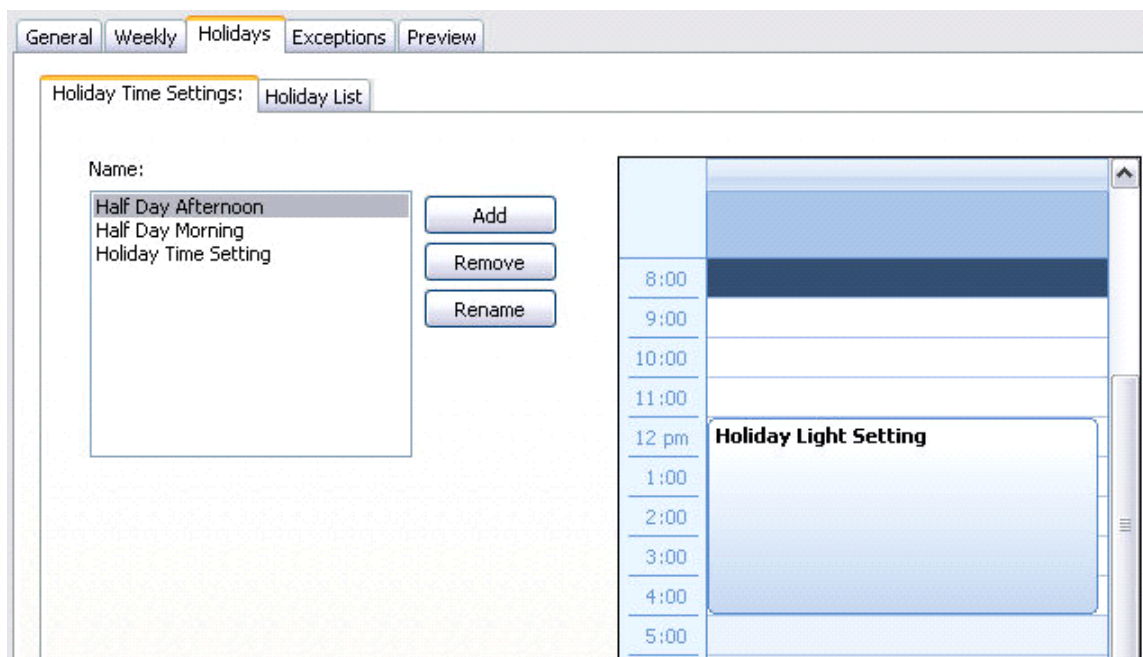


5. In the **Event Properties** dialog box enter the name of the holiday event Subject (or setting) as shown below.
6. You can alter the **Start time** and **End time**, if desired, or set it to an All day event (which is already the default).
7. Set the **Event Priority** (for the holiday) and assign a **ValueSet Value**.

Set a holiday schedule using the Event Properties dialog box.

8. Click **the** OK button to return to the Holiday Settings tab, which looks as shown below.

The new holiday time setting appears once the event properties are set.



At this point you have a time settings schedule that you can apply to the specific holiday(s) you wish to apply it to.

To apply a time settings schedule to a holiday:

1. Click on the **Holiday List** tab.
2. Click on the **Time Settings** column for a specific holiday. A drop down list will be shown where you can select the **Time Settings schedule** you desire from the list.

The Holiday list appears at this point similar to the one shown below.

Applying a Time Setting schedule to a specific holiday.

The screenshot shows the 'Holidays' tab in the GENESIS32 ScheduleWorX32 application. The 'Holiday List' sub-tab is active. The 'Holiday List' dropdown is set to 'U.S. Holidays'. A 'Configure' button is next to it. Below is a table of holidays:

Holiday Name	Time Settings	Start Date	Multi-Day
Independence Day		Friday, July 04, 2008	False
New Year's Day	Full Day Holiday	Tuesday, January 01, 2008	False
Christmas		Tuesday, December 25, 2007	False
Thanksgiving		Thursday, November 22, 2007	False

3. Click the **Apply** button to enforce the holiday schedule you just assigned.

ValueSets

ValueSets, Tags, and Resources

ValueSets are a collection of values or states that can be assigned to a resource by a tag. The utility of valuesets is that it lets you create a group of values that you can apply to multiple data tags. You can think of valuesets as the group of values that populate a list box. When you create a schedule in ScheduleWorX32 you are defining the schedule for a resource that is controlled by a device. The tag that actually controls the device is essentially a device driver. Tags abstract the details of controlling the device from the settings or states that you assign to that device.

You could have a ValueSet with values that are:

- Static values
- Expression
- Alias
- Another OPC tag

When you create a schedule you associate a valueset with that schedule on the General tab as shown in the figure below.

Assign a valueset to a schedule on the General tab.

The screenshot shows the 'General' tab of the 'Building HVAC Schedule' configuration window. On the left is a tree view with 'Schedules' expanded, showing 'Building Floor 1 Lights', 'Building Floor 2 Lights', 'Building HVAC Schedule' (selected), and 'PaintShop Schedule'. Below it are 'ValueSets' and 'Holidays'. The main panel has tabs for 'General', 'Weekly', 'Holidays', 'Exceptions', and 'Preview'. The 'General' tab contains the following fields:

- Schedule Name:** Building HVAC Schedule
- Schedule Description:** (empty)
- ☒ **Enable Schedule**
- Scan Rate (ms):** 500
- Effective Period:**
 - From:** 10/23/2007 ☐ Active
 - To:** 10/31/2007 ☐ Active
- ValueSet:**
 - ValueSet Name:** HQ HVAC
 - Default ValueSet Value:** All On

When you assign a Valueset Name to a schedule, what you are saying is that this valueset is the range of values or conditions that can be set for the tag(s) that controls the resource. You can use a valueset in any number of schedules, but you can only assign one valueset to a schedule.

CAUTION: *It is highly recommended that only one enabled schedule use each valueset at one time to avoid having schedules overwrite each other's values.*

Notice too that there is a Default Value Set value specified. If there are no events occurring that would alter the value passed by the schedule to the tag, then the default value is the value given to the tag and set on the device that controls the resource.

ValueSets must be defined in the ValueSet section of ScheduleWorX32 in order to be assigned to a schedule. The definition of a valueset can be established in ScheduleWorX along with the associated values and data types, and the valueset data is stored in the ScheduleWorX32 database. ValueSets stored in the ScheduleWorX32 database are replicated to the database of the Unified Data Manager. You can open and view ValueSets for ScheduleWorX32 in the ValueSet node of the UDM, as shown below. The Unified Data Browser is another application that can be used to assign valuesets, and is used on the ValueSet Values tab of the ScheduleWorX32 ValueSet properties.

Please note that the Unified Data Manager Configurator also shows ValueSets, however these are not the same as the ones created in ScheduleWorX32, which are kept separate and only shown in ScheduleWorX32 to avoid conflicts. The Unified Data Browser is another application that can be used to assign valuesets, and is used on the ValueSet Values tab of the ScheduleWorX32 ValueSet properties.

Create a ValueSet

You create a new valueset and assign values to it using the ValueSet node in the tree control. When you create a new valueset several tabs appear that let you set the properties of the valueset.

To create a folder to contain your valuesets:

1. Right click on the ValueSet node or another folder and select the **New Folder** command from the context menu (Ctl+F)
2. Enter the name of the folder into the **Name** text box.
3. Click the **Apply** button.

To create a new valueset:

1. Right click on the ValueSet node, or on the folder that will contain your valueset and select the New ValueSet command from the context menu.

Enter a name and description for your valueset on the ValueSet Properties tab.

If you try and click the Apply button at this point ScheduleWorX32 posts the following alert box and moves you to the ValueSet Tags tab.

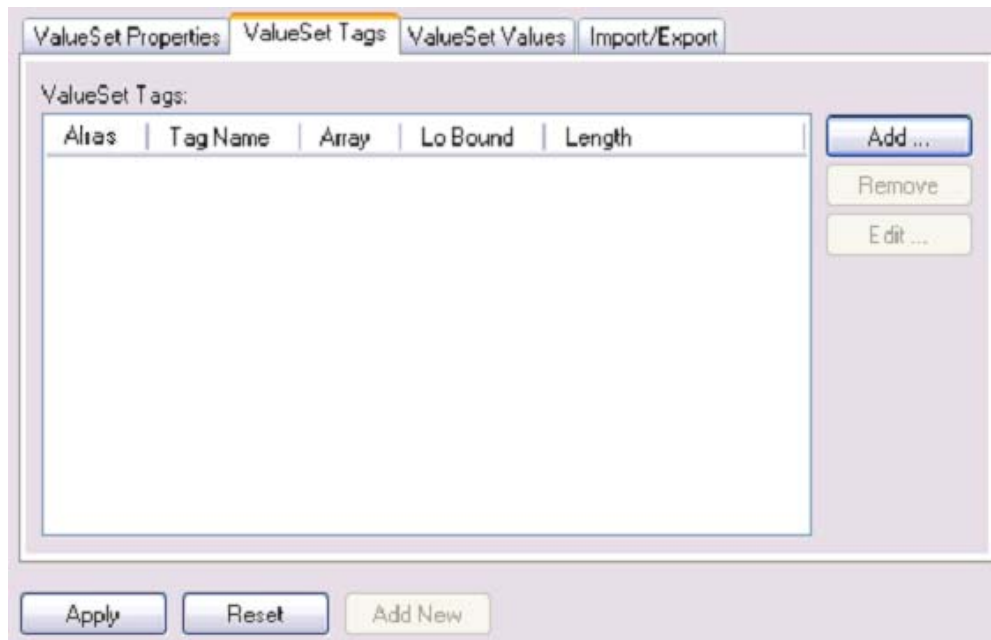
ScheduleWorX32 behaves like a wizard when you create ValueSets, prompting you to enter needed properties before saving your new valueset.



2. Click on the **ValueSet Tags** tab; then click the **Add** button.

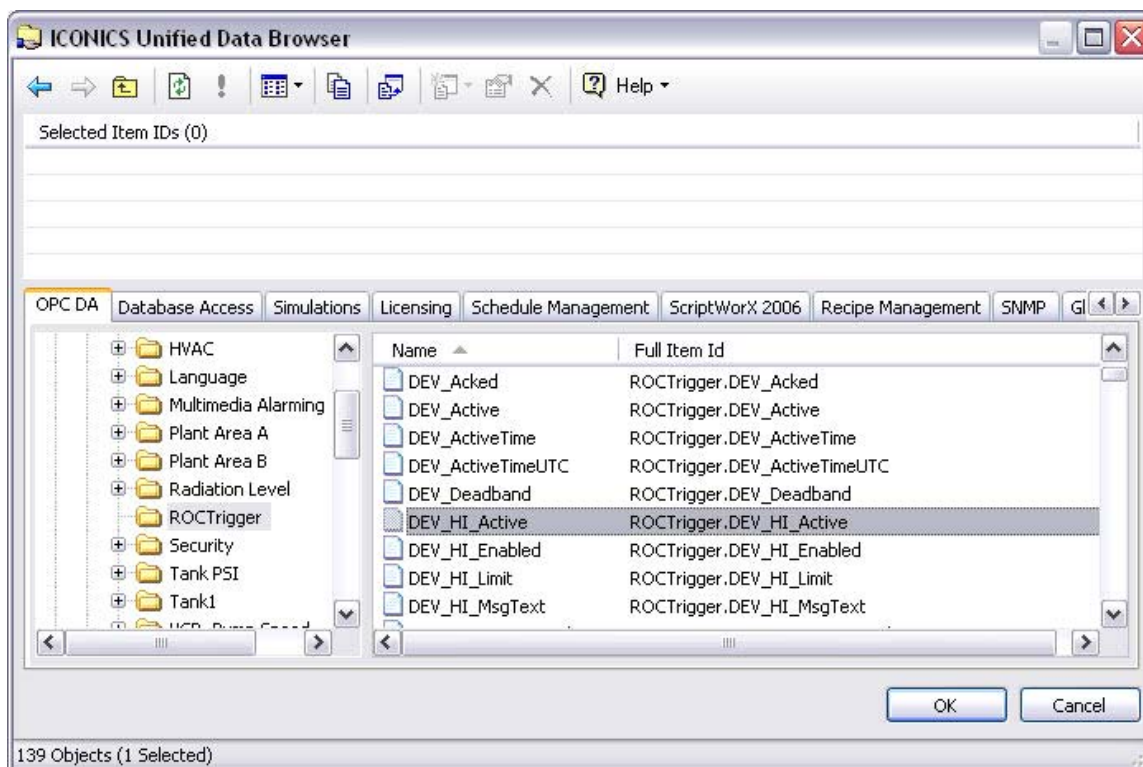
On the ValueSet Tags you specify the software that will send your event values to the device you are interested in controlling. Different tags can talk to different OPC devices. When you click the Add button the ICONICS Unified Data Browser appears.

The ValueSet Tags tab is where you select the tags that define your resource.



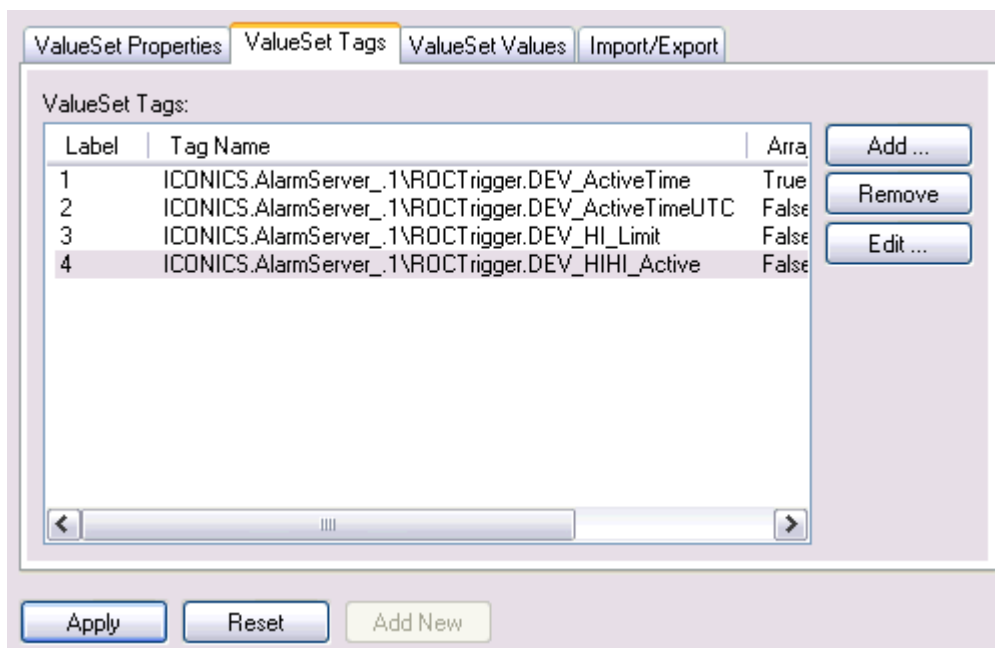
3. In the Unified Data Browser **select the tag(s)** your valueset values will to be applied to. Double click on the name to add it to the Selected Items ID(s) list.
4. When your tags are selected, click the **OK** button.

The Unified Data Browser is where you assign tags to your valueset.



With some tags added the ValueSet Tags tab will look similar to the one below.

The ValueSet Tags tab with some tags added to it.



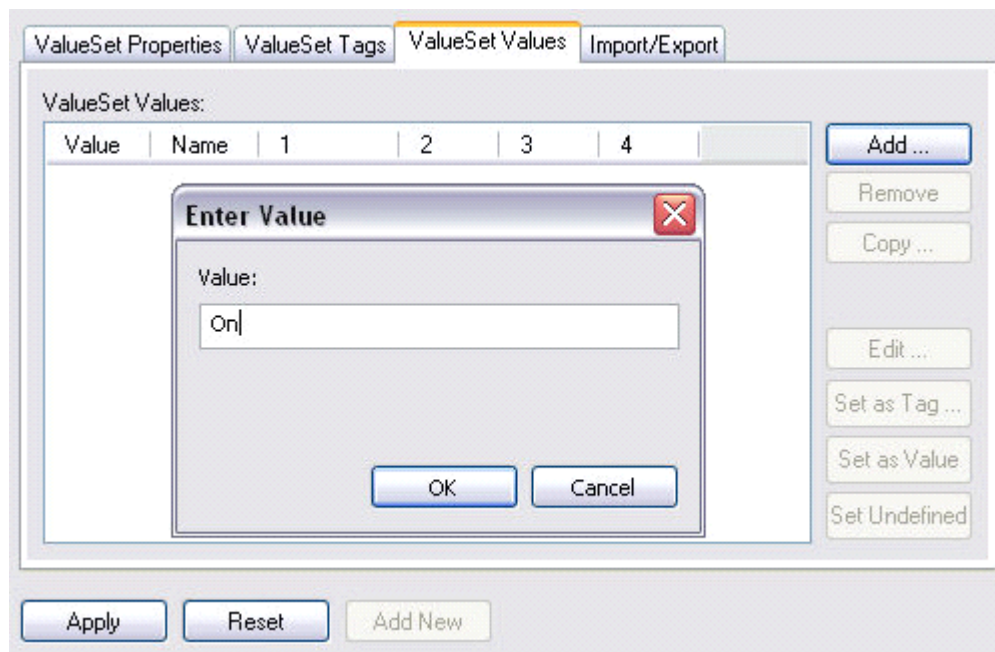
If you try and click the Apply button at this point ScheduleWorX32 posts the following alert box and moves you to the ValueSet Values tab.

You must create values for a new valueset before you can save the valueset to the ScheduleWorX32 database.



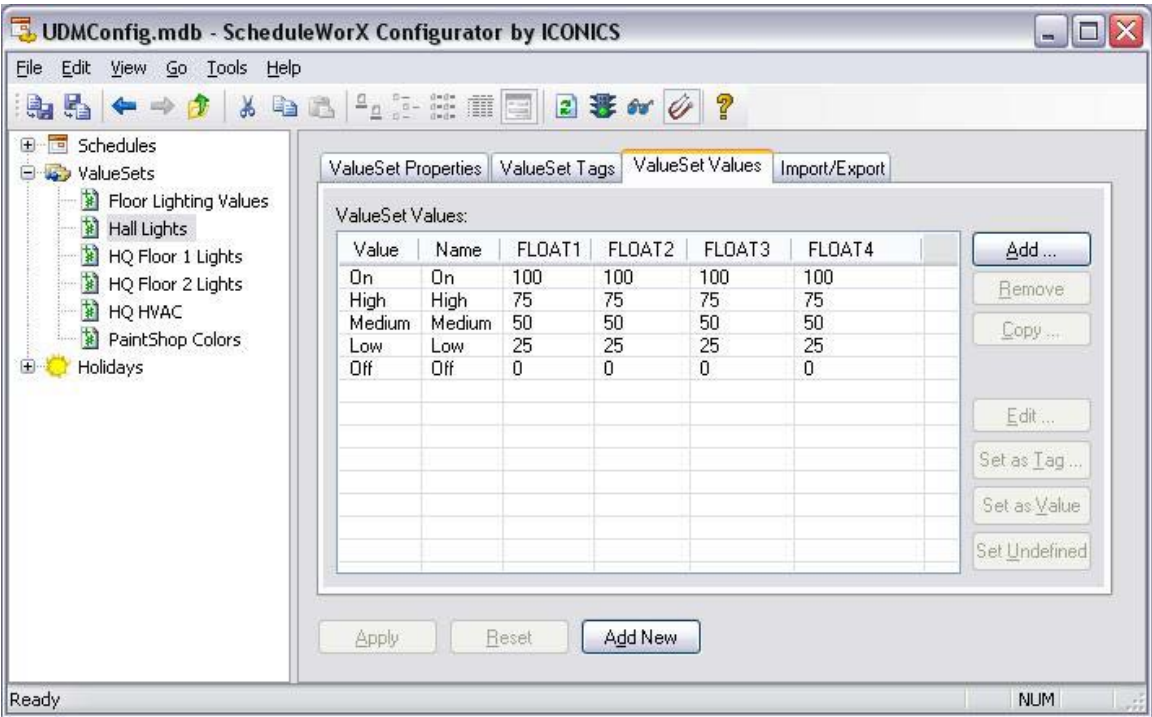
5. On the ValueSet Values click the **Add** button and enter the value in the **Enter Value** dialog box.

Enter a value that will be part of your valueset here.



6. After you enter all of your values, click the **Apply** button to save the valueset.

With values entered you can now click the Apply button to save your new valueset.



Parameters

Parameters are a way of using the same valueset in multiple schedules. You pass the parameter to each schedule using the parameter name as part of the valueset reference. Parameters are an advanced, but powerful feature that allow you to reuse a valueset rather than creating multiple copies, when tag names differ on by a few parameters. For example, the following demonstration uses a parameter in the valueset to control the lighting on multiple floors, where each floor has a different number.

To setup **parameters**:

1. Insert a **parameter** in the parameters section of the ValueSet Properties page. This will be the parameter that is used to designate the desired floor.

Parameters allow you to reuse valuesets in different schedules applied to different resource.

Name	Data Type	Places	Padding	Alignment
FloorX	String	0	-	Left

2. On the ValueSet Tags page, **select a tag** for the desired resource, and **replace** part of the tag name with the **parameter**.

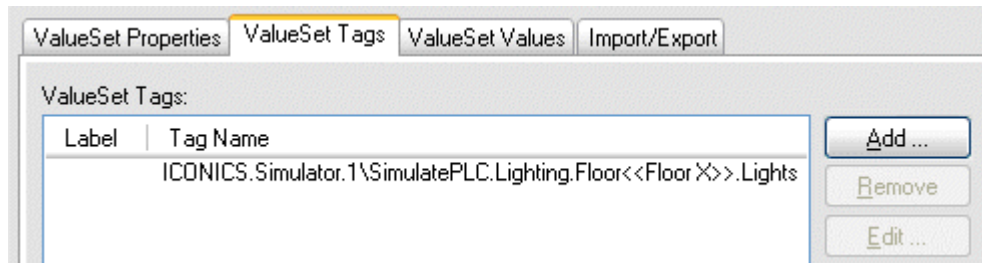
For example, in the image below you could use a parameter to switch between Floor1 and Floor2, which both contain the tag "Lights"

ValueSet tag which will use the parameter.

Label	Tag Name	Array
	ICONICS.Simulator.1\SimulatePLC.Lighting.Floor1.Lights	False

3. Then **type in the parameter** in place of the floor number.

Adding the parameter to the tag name.



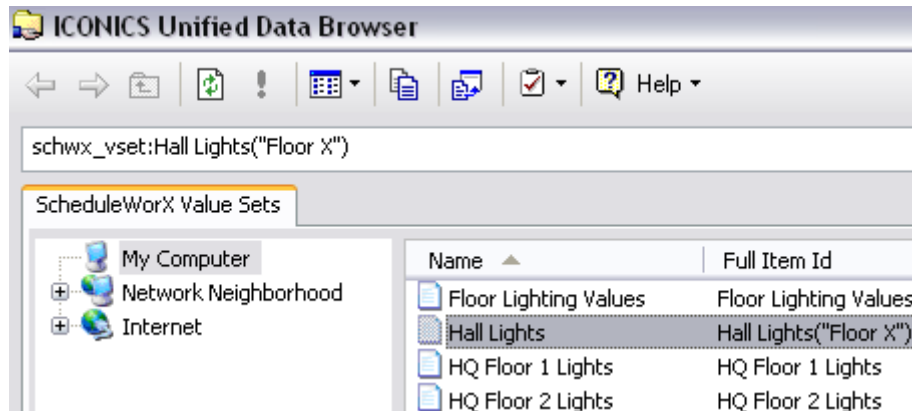
4. Next **create the desired schedule** that should use the parameterized valueset.

Once the valueset name is selected the parameter variable will show up in the valueset Name field.

Schedule showing the valueset parameter.

When selecting the valueset to associate with a schedule in the Unified Data Browser, it will show the name of the configured parameters.

Unified Data Browser showing parameterized valueset.



5. Then **replace the Parameter variable** with the **floor number** that should be controlled by this particular schedule. Also give the schedule a name that reflects the floor that was chosen.

At this point the Schedule has been configured to use the parameterized ValueSet, so that it will control the Hall Lights for Floor 2.

Completed schedule using parameterized valueset.

General Weekly Holidays Exceptions Preview

Schedule Name: Hall Lighting - Floor 2

Schedule Description:

☒ Enable Schedule Scan Rate (ms): 500

Effective Period

From: 11/ 5/2007 ☐ Active

To: 11/ 5/2007 ☐ Active

ValueSet

ValueSet Name: Hall Lights(2)

Default ValueSet Value: All Off

6. To make a schedule that refers to the tag that controls lighting on Floor 1 you **adjust the parameter** in the ValueSet name.

Using the parameterized valueset in a different schedule.

General Weekly Holidays Exceptions Preview

Schedule Name: Hall Lighting - Floor 1 ...

Schedule Description: | ...

☒ Enable Schedule Scan Rate (ms): 500

Effective Period

From: 11/ 5/2007 ... ☐ Active

To: 11/ 5/2007 ... ☐ Active

ValueSet

ValueSet Name: Hall Lights(1) ... Configure

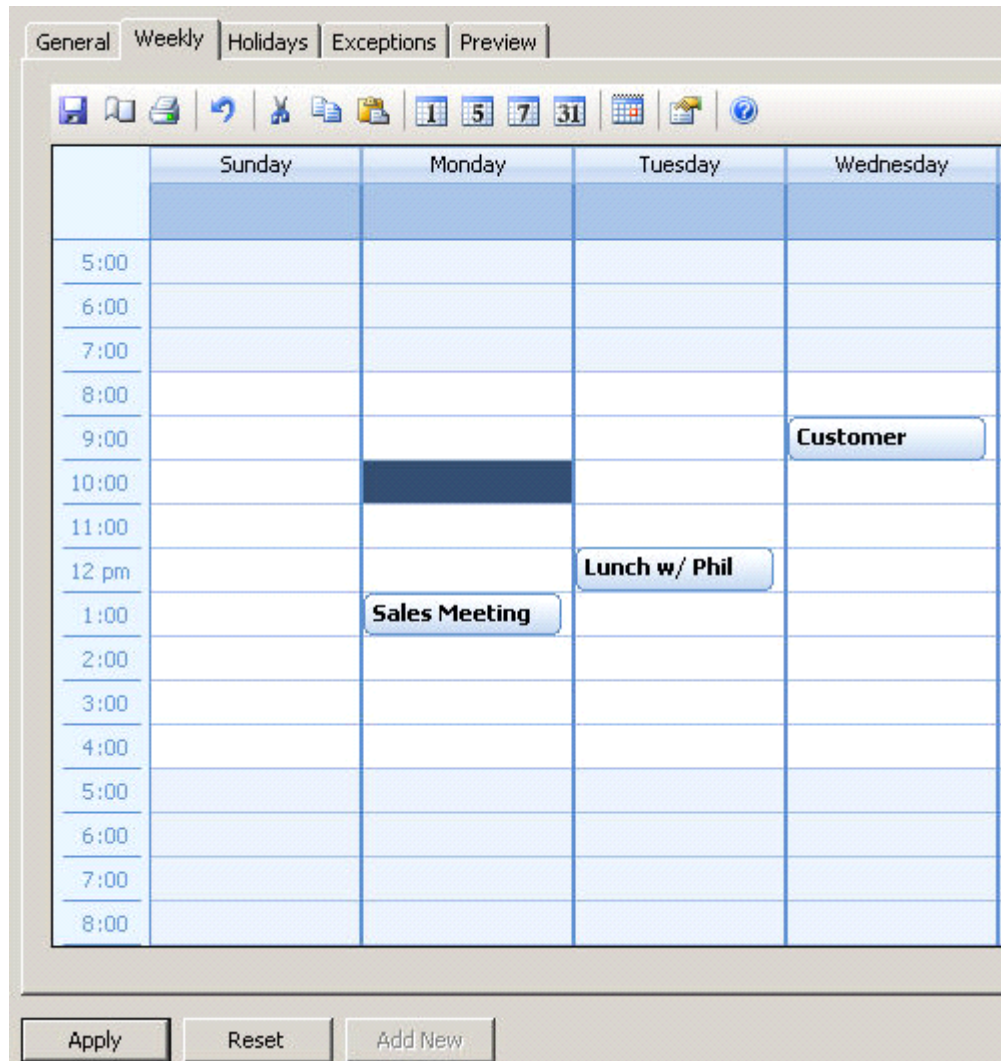
Default ValueSet Value: All Off v

Calendars

Calendars represent the view of a schedule over time. You can alter the schedule you see on your screen by moving between the different tabs:

- The **Weekly view** shows weekly recurring events. You can set the number of days in the work week, and which days are part of the work week (or schedule). Only weekly recurring events show on this tab. You can print this calendar of your regularly scheduled events.

Weekly calendar.

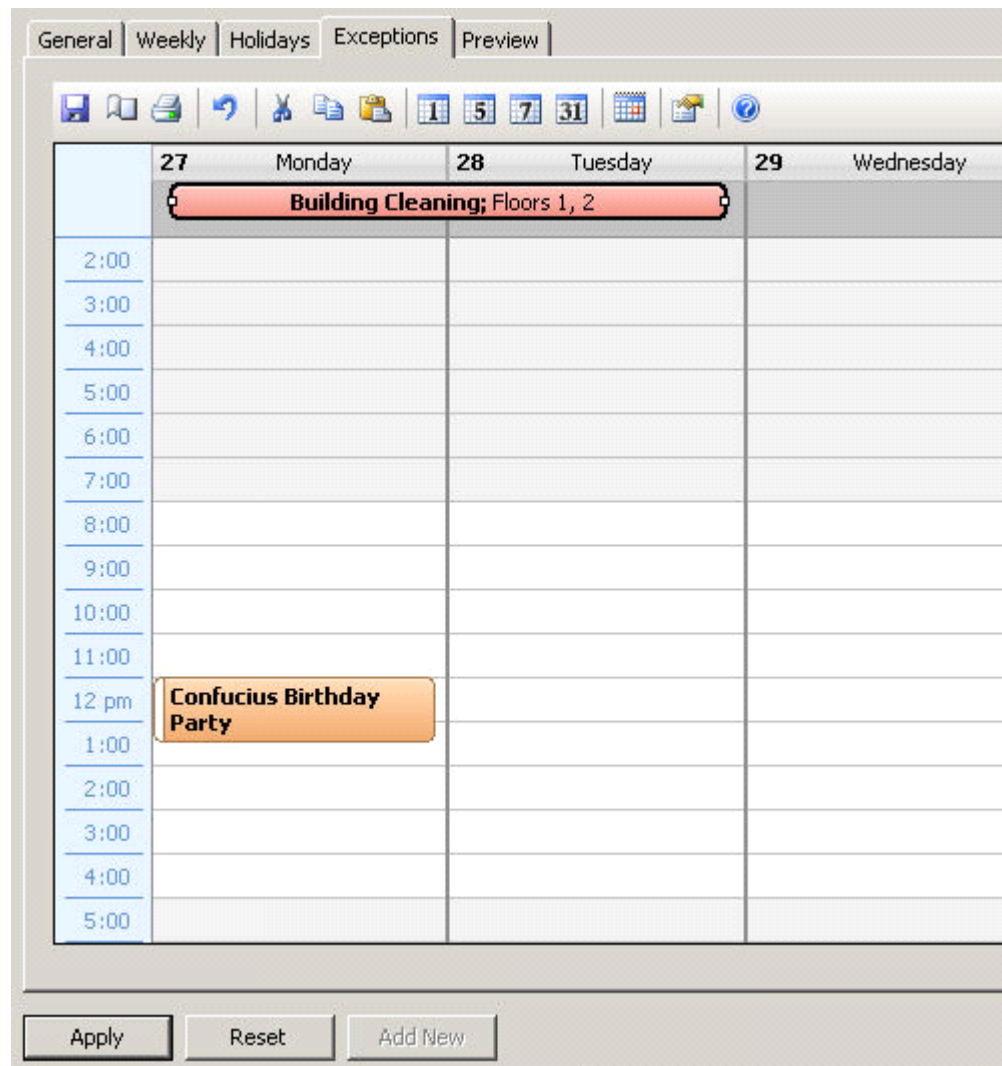


- The **Holidays tab** shows a smaller calendar that represents just a 24 hour period.
- The **Exceptions tab** shows a calendar with only exception events displayed.

You can set the number of days displayed in the calendar to one day, seven days, or a month. In the seven day (week) view you can use the day of the week check boxes to display or hide specific days of the week. You

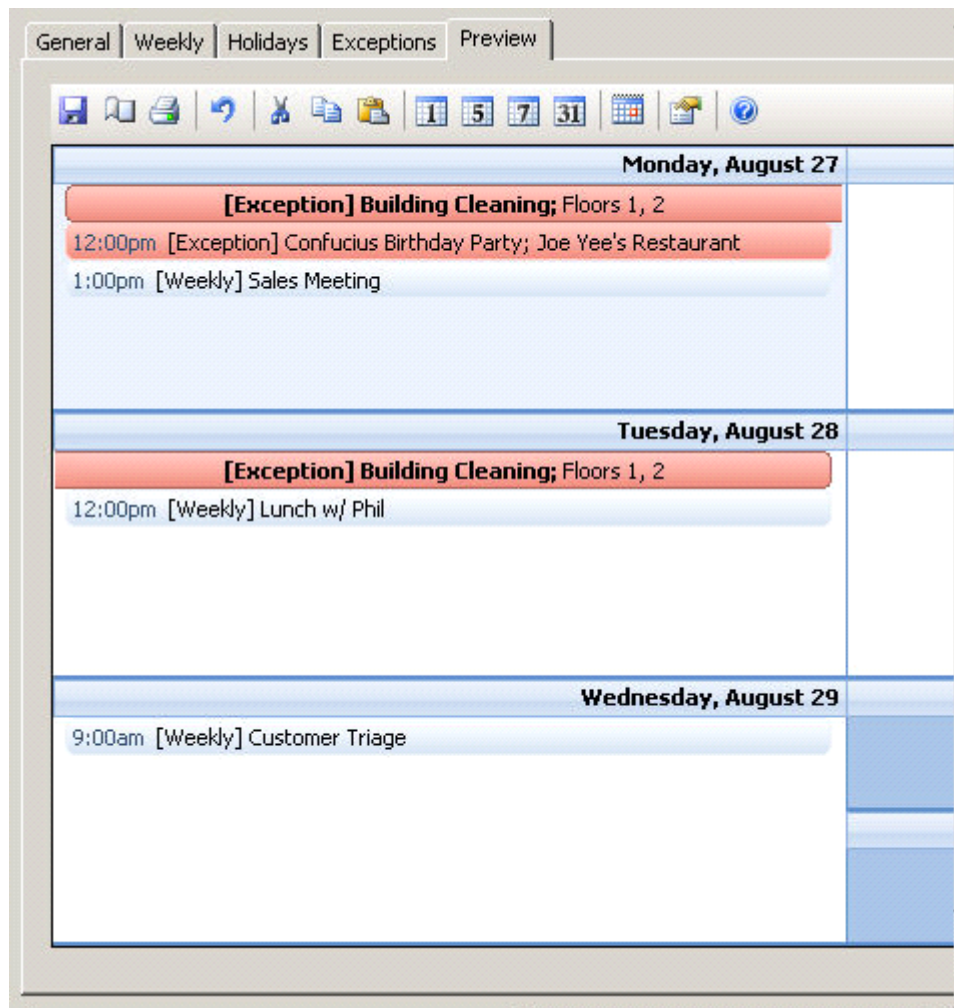
can print the Exception calendar and it will print your current calendar view but will only display exception events in the printout.

Exceptions calendar.



- The **Preview tab** shows all defined events in a read-only display. You cannot create events on this tab, but you have the greatest flexibility in how you set up the calendar on this view. You can set one day, five days, seven days, and 31 day views on this tab. You can also print this calendar to see all defined events of all types.

Preview Tab

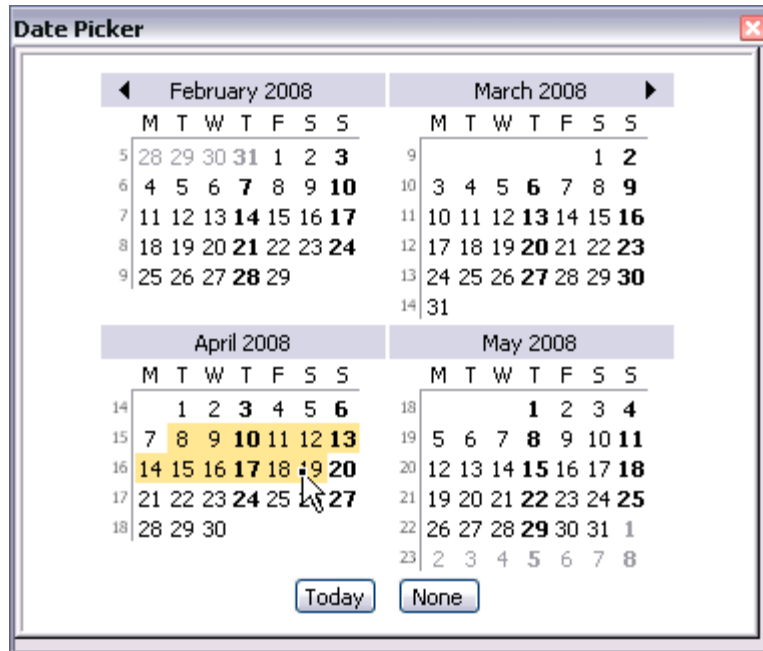


If you want to see what events are currently enforced, use the Monitor view for this purpose. To determine which events were defined for a time period, and not just the events that are active, use the Diagnostic view.

ScheduleWorX32 lets you set a custom view of any number of days. To set a custom view, do the following:

1. Click on the **Date Picker** icon in the Properties toolbar.
2. Drag your selection through the **range of dates** you want to display, as shown in the figure below.

Selecting a custom range of dates to display in your calendar.



3. **Close** the Date Picker, and the calendar that is closest to your selection appears.

Above 12 days were selected, so the calendar closest to that number is a two week display as shown below.

A custom calendar display.

	Monday	Tuesday	Wednesday	Thursday	Friday	Sat/Sun
	Apr 7	8	9	10 [Weekly] Weekly	11	12
Apr 7 - 13						13 8:00am [Weekly] I
	14	15	16	17 [Weekly] Weekly	18	19
Apr 14 - 20						20 8:00am [Weekly] I

Print a Calendar

You can print a calendar for a day, week, month, quarter, or any custom date range you wish. The procedure is easy to set up and uses standard Windows Print Setup and Print dialog boxes.

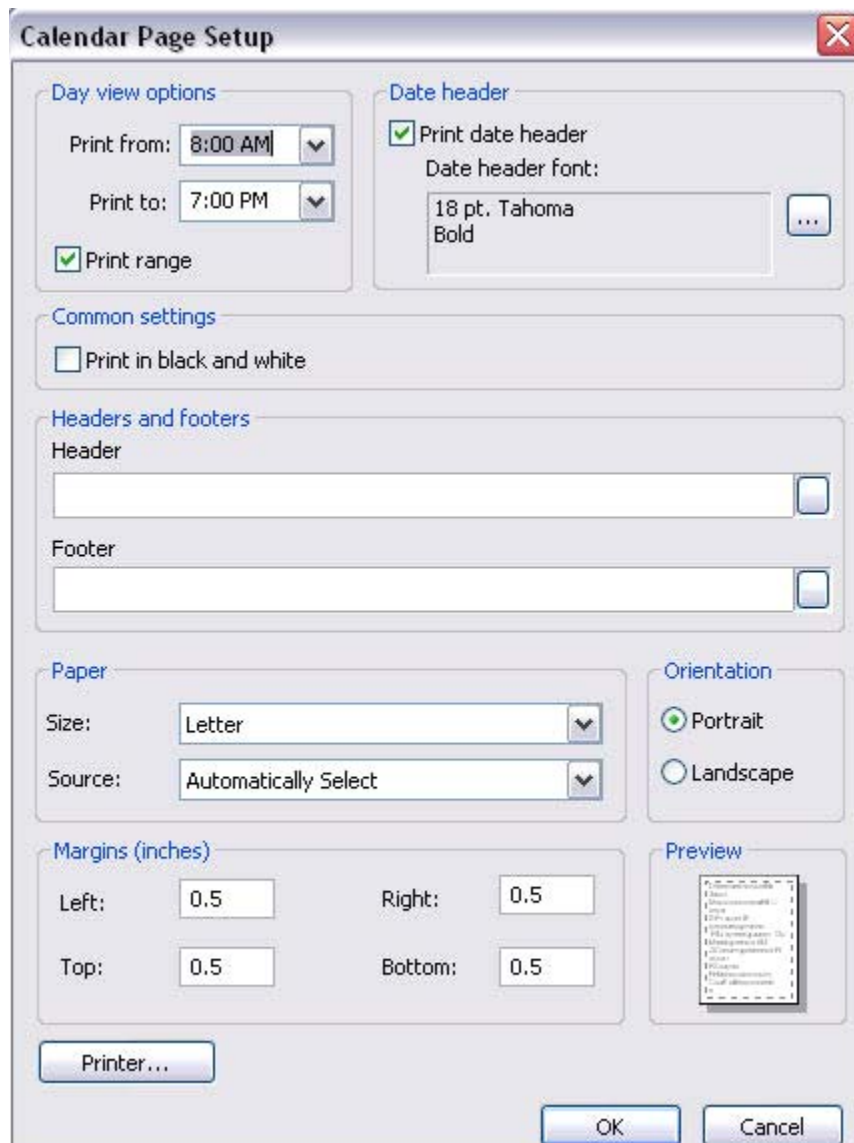
Although you can print from either the Weekly, Exceptions, and Preview calendars, only the Preview calendar will show you all of the events that have been applied to your schedule. You should only use the Weekly and Exceptions view to print from when you only want to see Weekly and Exception events appear on your printout.

To set the page setup for your calendar schedule print job:

1. Click on the Preview tab and select the view of the calendar that you wish to print.
2. Click on the Print Setup button on the toolbar to set the format of your printed output.

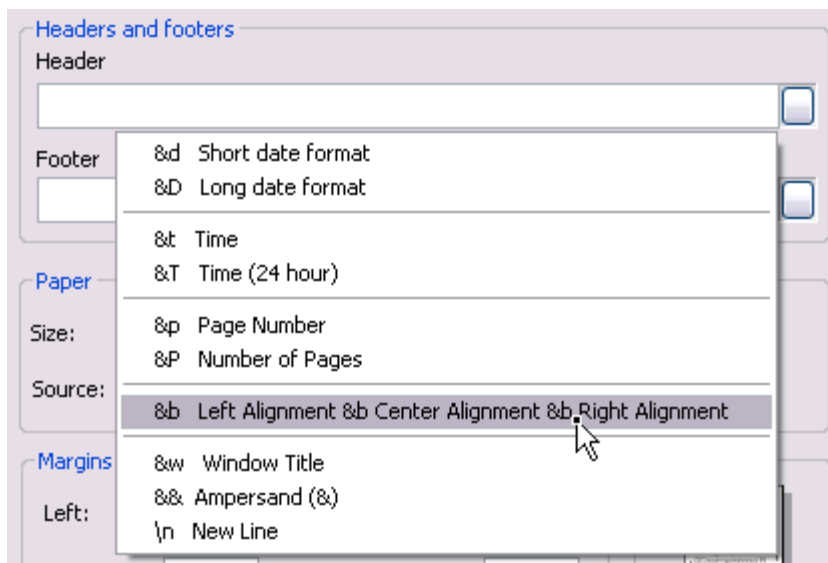
The Print Setup dialog box appears as shown below.

Calendar Page Setup is a standard Windows page setup dialog box.



3. Select the page setup **options** you desire.
4. Of particular note are the **Header and Footer options** which can be selected by clicking the buttons at the right of those two drop down lists. Select your Header and/or Footer options from the list as shown below.

Headers and Footers offer a drop down list that can set the format you desire for these two features.



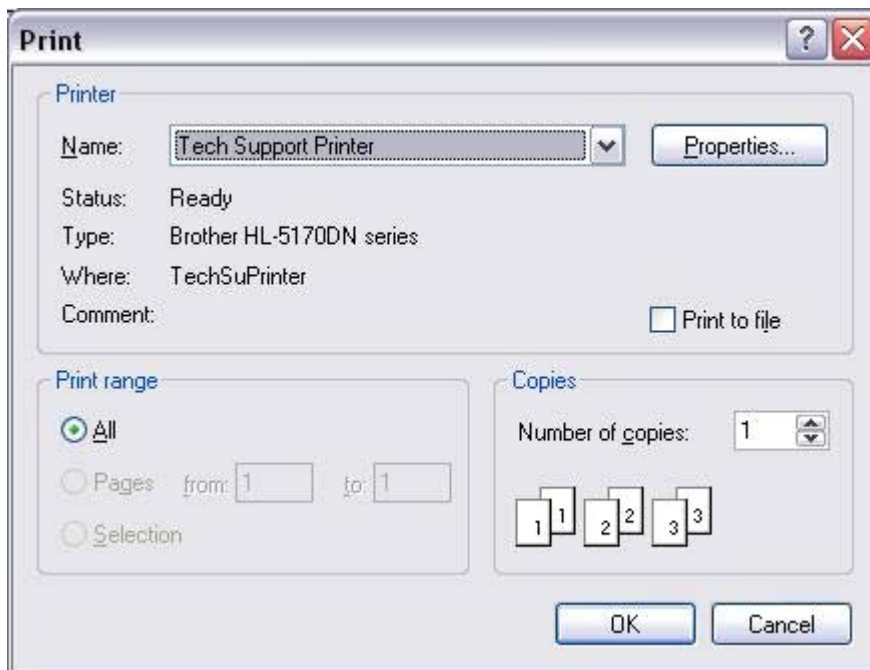
5. Click the **OK** button to store your page setup settings.

To print your calendar schedule:

1. With the calendar view that you want to print showing and the page setup options the way you want them to be applied initiate a print job by clicking on the Print button on the toolbar.

The Print dialog box appears as shown below.

The Print dialog box.



2. Select the printer **Name** and the number of copies; then click the **OK** button to print the schedule.

There are no Print range options, the schedule must be printed in its entirety.

Events

Events are time periods with actions associated with them that are applied to resources. You can create a single event or a recurring event and assign an action controlled by a valueset to the resource for that time period. For example, you can have the light turn on and then off every Monday at 8 AM and 5 PM (respectively) on your main floor for restocking. Each event is given a name, the action is controlled by the start and stop time assigned to the event. The valueset will contain OPC tags that control the resource that is scheduled. For example, when the resource represents lights the action can be the values contained in the OPC tag that controls the lights settings.

In order to create an event you need to have first assigned a valueset to the schedule. The topic [ValueSet](#) described in detail valuesets, but you can view a valueset by simply double clicking on its name in the tree control. In the example that follows the valueset is called "On or Off" and it is a Boolean with values 1 for On and 0 for Off.

Events can be created and assigned on the Weekly, Holiday, or Exception tab. When there is no event active, the default condition on the General tab applies. The Preview tab allows you to view all of your events, but doesn't allow you to create events.

An event that you create on the Weekly tab is a recurring event with a period of one week.

To create a weekly event:

1. Highlight the schedule name that will contain the event in the tree control, then click on the Weekly tab.
2. Double click on a **time period**, or click and drag the time period desired.

The Event Properties dialog box appears as shown below.

Weekly Event Properties dialog box.

The screenshot shows the 'Event properties' dialog box. The 'Subject' field is filled with 'Restocking Floor'. The 'Location' field is empty. The 'Label' dropdown is set to 'None'. The 'Start time' is set to 9:00:00 AM and the 'End time' is set to 5:00:00 AM. The 'All day event' checkbox is unchecked. The 'Event Priority' is set to 1. The 'ValueSet Value' dropdown is set to 'On'. The 'OK' and 'Cancel' buttons are at the bottom.

3. Enter the name of the event in the **Subject** field; the **Location** and **Label** are optional settings. While schedule names must be unique in

ScheduleWorX32, event names do not have that requirement, but it can be helpful to avoid confusion.

4. If you enable the **All day event** check box the time fields disappear. To have an event start and stop, enter the **Start time** and **End time** into those two combo boxes, respectively.

Note: Weekly events by definition reoccur on a weekly basis. Missing from this dialog box is the Recurrence button that you will see in a moment for Exception events.

5. A schedule has a valueset assigned to it, but you need to select the **ValueSet Value** from that field. The value is the value given to the OPC tag when this event becomes effective, and represents the action to be taken by the resource.
6. Set the **Event Priority** by either entering a value from 1 to 1000 or by select the value from the combo box's drop down list.

Event priorities are used to determine which event takes priority and runs when there is a conflict. The Event priority is used to compare two weekly events against one another. If you define a default event it takes a lower precedence than weekly events. Holidays take precedence over weekly, exceptions take precedence over holidays and weekly events, and overrides take precedence over all other events. For a fuller discussion of priorities and precedence, go to the Priorities topic.

7. Click the **OK** button to return to the Weekly tab, and then click the Apply button to save the event.

Weekly events are central in ScheduleWorX32 as the tool is meant to provide an organizational structure for the work week. Exceptions create one time or recurring events that take precedence over weekly events. If you want to create an event that is neither a weekly recurring event or a holiday, then you should define that event(s) as an Exception event.

Holidays are defined as a day of the year. Although some holidays always fall on the same day or date of the year, it is not required. For example, Christmas is always December 5th in any year, although for two out of seven years when December 25th falls on a weekend it will not impact a work week. Other holidays such as the Thanksgiving holiday in the United States fall on the fourth Thursday of November. Thanksgiving will always impact a work week. ScheduleWorX32 gives you the flexibility to define both types of holidays. You can also create holidays that recur daily, weekly, or monthly, which can be useful for regular company events. For more information about configuring holidays, please see the HolidaysHoliday_and_Special_Events topic.

The one last "event" isn't really an event at all, it's an override. You apply an override directly to your schedule during runtime, specifying the override condition as well as the amount of time the override will be active (which can be undefined for an override that applies indefinitely). An override is similar to taking manual control over your schedule and takes precedence over all other events.

Priorities

ScheduleWorX32 prioritizes scheduled events using a strict order of precedence that first evaluates the event type and then evaluates the event priority. This order determines which event runs whenever there is a conflict between two or more events.

The order that event types are processed is as follows:

1. If there are no scheduled events ScheduleWorX32 runs the default value defined on the General tab shown below.

A default value runs whenever no other event is scheduled.

The screenshot shows the 'General' tab of the ScheduleWorX32 configuration window. It contains the following fields and controls:

- Schedule Name:** Text box containing 'Building One Lighting'.
- Schedule Description:** Text box containing 'Main Building Schedule'.
- Enabled Status:** A dropdown menu.
- Effective Period:** A section containing:
 - From:** Date picker set to '8/22/2007' with an 'Active' checkbox.
 - To:** Date picker set to '8/22/2007' with an 'Active' checkbox.
- ValueSet:** A section containing:
 - ValueSet Name:** Dropdown menu set to 'vset:ScheduleWorX Items.On or Off' with a 'Configure' button.
 - Default ValueSet Value:** Dropdown menu set to 'Default'. This field is circled in red in the original image.

2. A weekly event runs in preference to the default value.
3. A weekly scheduled event with a higher priority will run before a weekly scheduled event with a lower priority. Priorities can be set at a number from 1 to 1000.

Note: One way to remember the order of precedence for event types is to think of the Event Properties multi-tabbed pane as a wizard. The lowest precedent event you define is on the General tab. Moving from left to right weekly is higher, holidays higher still, and exceptions run in precedence to all of these other events. You can set an override to any event and that override value will be applied for the duration of the override you specified.

4. A holiday event runs in preference to either a weekly event or the default value.
5. A holiday event with a higher priority will run before a holiday event with a lower priority. Priorities can be set at a number from 1 to 1000.

6. An exception event runs in preference to a holiday, weekly, or the default event.

Note: If you want to schedule an event with only one instance, then you need to schedule it as an exception event.

7. A exception event with a higher priority will run before a exception event with a lower priority. Priorities can be set at a number from 1 to 1000.
8. An override takes precedence over any other type of event

Dates and Times

You have control over the following aspects of dates and time:

- You can set the start and a stop dates and times of schedules, events, holidays, and exception events.
- Dates start and end at midnight.
- You can color the calendar so that work hours are light and non-working hours are shaded using the Start time and End time in the Calendar Properties toolbar.
- ScheduleWorX32 uses your computers current date and time and daylight savings time as its time standard.
- You can set a time scale for the daily view. Increments show up as cells on the grid.

Recurring Events

Recurring events are events that take place after a specified period of time. You can have recurring events that occur:

- Daily at the same time of day.
- Weekly at the same time and day of the week
- Monthly on the same date of the same week of the month; that is, the first day of each month.
- Monthly at the same time and day of the month; that is, the third Thursday of a month.
- Yearly on the same date of the year; that is, December 25th as Christmas.

There are three places where you can set recurring events:

- **Weekly tab.** All events that you create on the Weekly tab are **weekly recurring events**.
- **Exception tab.** All recurring events that you create on the Exception tab are exception events and take precedence as normal over the weekly events defined on the Weekly tab, or any holiday events, or exceptions with a lower priority.
- **Holiday tab.** When you create a holiday list you can configure the recurrence pattern for each holiday that you insert. For recurring holidays the Holiday Time Settings assigned to that holiday will be automatically applied to each occurrence of that holiday.

Regularly Scheduled Weekly Events

To create a weekly event at the same day and time of the week:

1. Click on the **Weekly** tab.
2. Double click on the **time period** you want to define as a weekly event
Or if the event will span more than one time period click and drag to create an event for that length of time; then right click on the event and select the Create New Event command from the context menu.
In either case the Event Properties dialog box shown below appears.

The Event Properties dialog box in the Weekly view defines weekly recurring events only.

Event properties

Subject: Confucious Birthday Party

Location: Joe Yee's Restaurant Label: None

Start time: 8:00:00 AM ☐ All day event

End time: 10:00:00 AM

Event Priority: 1 Value Set:

OK Cancel

3. Enter the **Subject**, which is the name of the event that appears in the calendar. Subject names must be unique.
4. Enter the location into the **Location** text box (optional).
5. Select a **category** from the drop down list (see below) if desired (optional)

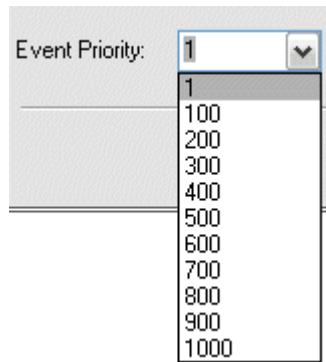
The Label menu.

Label: White

- White
- Red
- Blue
- Green
- Grey
- Orange
- Turquoise
- Brown
- Purple
- Blue-Gray
- Yellow

6. Enter the **Start time** and **End time** directly into these text boxes, or select the dates from the Date Picker by clicking the down arrow.
7. If the event is to be an all day event, then enable the **All day event** check box.
8. Events defined as regularly scheduled events and should a conflict occur the event with the highest priority gets to control the resource. Set the Event Priority in the combo box to any value between 1 and 1000.

Event Priority combo box.



9. When a valueset is assigned to the schedule the **ValueSet Value** list box is populated and you can select a value for the weekly recurring event that you are defining.
10. Click the **OK** button to create the regularly scheduled weekly event with the properties you entered.

Recurring Exceptions

All recurring events other than the regularly scheduled weekly events described in the previous section are scheduled as recurring exceptions or holidays. The precedence of these recurring events is handled exactly the same as for non-recurring events (see the Priorities topic for more details).

To set a recurring event as an exception event:

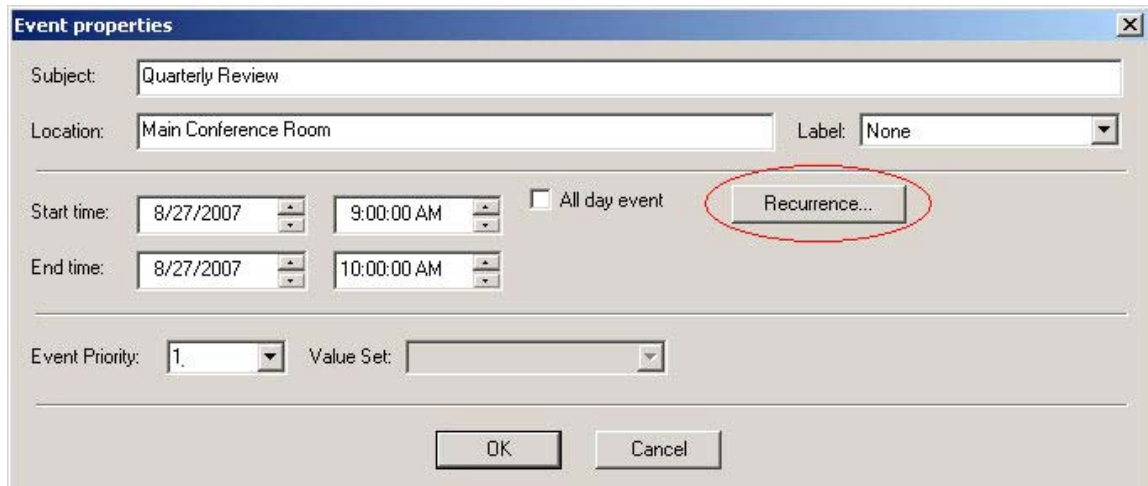
1. Click on the **Exception** tab.
2. Double click on the **time period** you want to define as a recurring event
Or if the event will span more than one time period click and drag to create an event for that length of time; then right click on the event and select the Create New Event command from the context menu.

In either case the Exception Event Properties dialog box shown below appears.

Note: The Exception Event Properties dialog box is identical to the Event Properties dialog box for the Weekly event, but now has an extra button...for Recurrence.

3. Fill out the remaining properties as desired, then click the **Recurrence** button that is shown in the figure below.

The Exception Event Properties dialog box allows you to define recurring events of all types, but as exceptions only.



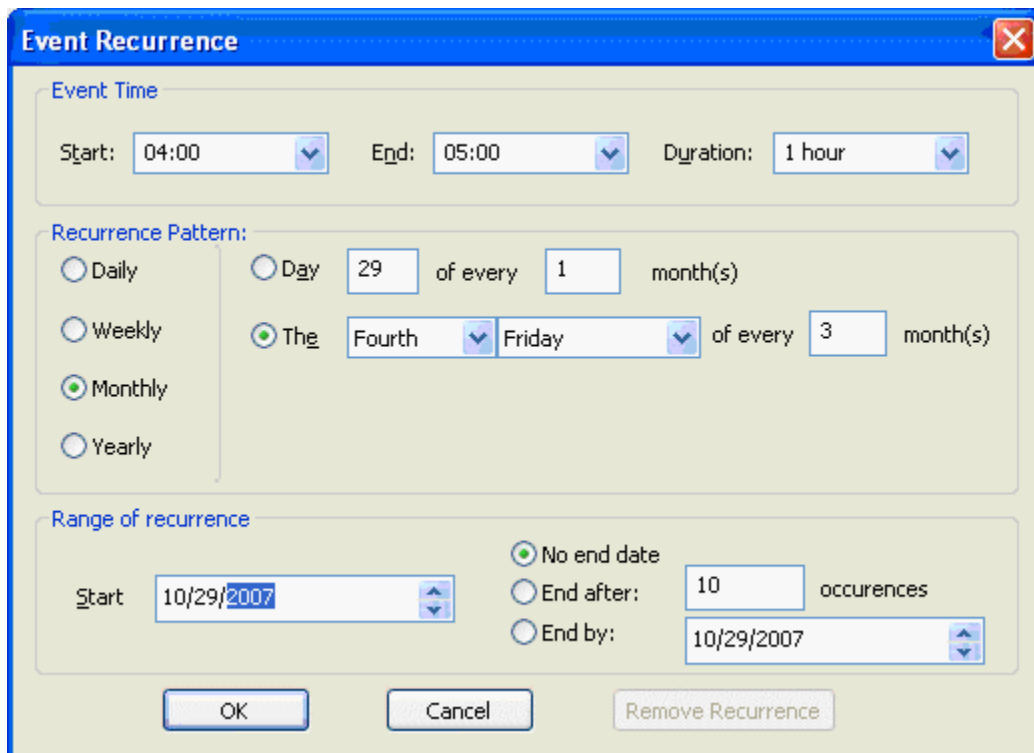
The 'Event properties' dialog box contains the following fields and controls:

- Subject:** Quarterly Review
- Location:** Main Conference Room
- Label:** None (dropdown menu)
- Start time:** 8/27/2007, 9:00:00 AM
- End time:** 8/27/2007, 10:00:00 AM
- ☐ All day event
- Recurrence...** button (circled in red)
- Event Priority:** 1 (dropdown menu)
- Value Set:** (dropdown menu)
- OK** and **Cancel** buttons at the bottom.

4. In the **Event Recurrence** dialog box shown below set the **Start** and **End** times from the Appointment Time section, and indicate the **Duration** of the event in that list box.
5. Click on the **Recurrence Pattern** to indicate if this is a Daily, Weekly, Monthly, or Yearly event.

When you select the Recurrence Pattern the choices change depending upon the selection.

The Event Recurrence dialog box for recurring exception events



The 'Event Recurrence' dialog box contains the following sections and controls:

- Event Time:**
 - Start:** 04:00 (dropdown)
 - End:** 05:00 (dropdown)
 - Duration:** 1 hour (dropdown)
- Recurrence Pattern:**
 - ☐ Daily
 - ☐ Day 29 of every 1 month(s)
 - ☐ Weekly
 - ☒ The Fourth Friday of every 3 month(s)
 - ☐ Monthly
 - ☐ Yearly
- Range of recurrence:**
 - ☒ No end date
 - ☐ End after: 10 occurrences
 - ☐ End by: 10/29/2007
 - Start:** 10/29/2007 (calendar icon)
- OK**, **Cancel**, and **Remove Recurrence** buttons at the bottom.

6. Set the Range of recurrence so that there is a **Start** date, and if desired an **End by** date.

You can also use No end date to have the event continue indefinitely or set a number of times that the event can recur by entering that number into the End after...occurrences text box.

7. Click the **OK** button to create your recurring event.

In the figure above the Monthly recurring exception event can on a particular date every month or on a particular day every recurring number of months. Other Recurrence Patterns display different settings. The figures below show Daily, Weekly, and Yearly Recurrence Patterns.

Daily Recurrence Patterns

Recurrence Pattern:

☒ Daily

☐ Weekly

☐ Monthly

☐ Yearly

☒ Every day(s)

☐ Every work day

Weekly Recurrence Pattern

Recurrence Pattern:

☐ Daily

☒ Weekly

☐ Monthly

☐ Yearly

Recur every week(s) on:

☒ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday

☐ Friday ☐ Saturday ☐ Sunday

Yearly Recurrence Pattern

Recurrence Pattern:

☐ Daily

☐ Weekly

☐ Monthly

☒ Yearly

☒ Every

☐ The of

Editing or Deleting Recurring Events

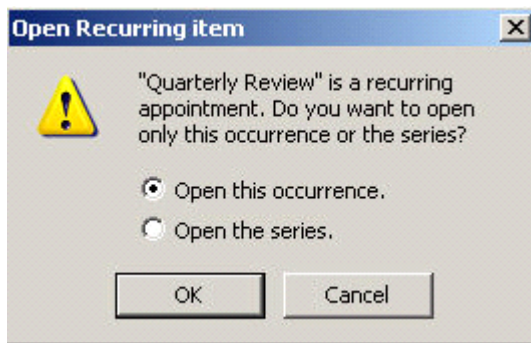
When you create an exception recurring event using the procedure above the event appears on your calendar. If you want to edit an exception recurring event you can do so by working with an instance of the recurrence or with all instances.

To edit a recurring exception:

1. Double click on a selected recurring event, the Open Recurring Item dialog box appears as shown below.
2. Click on Open this occurrence and then OK to edit the one instance of the recurring events that you selected.

3. Or, click on and then OK to edit all instances of the recurring events.

The Open Recurring Item alert box.



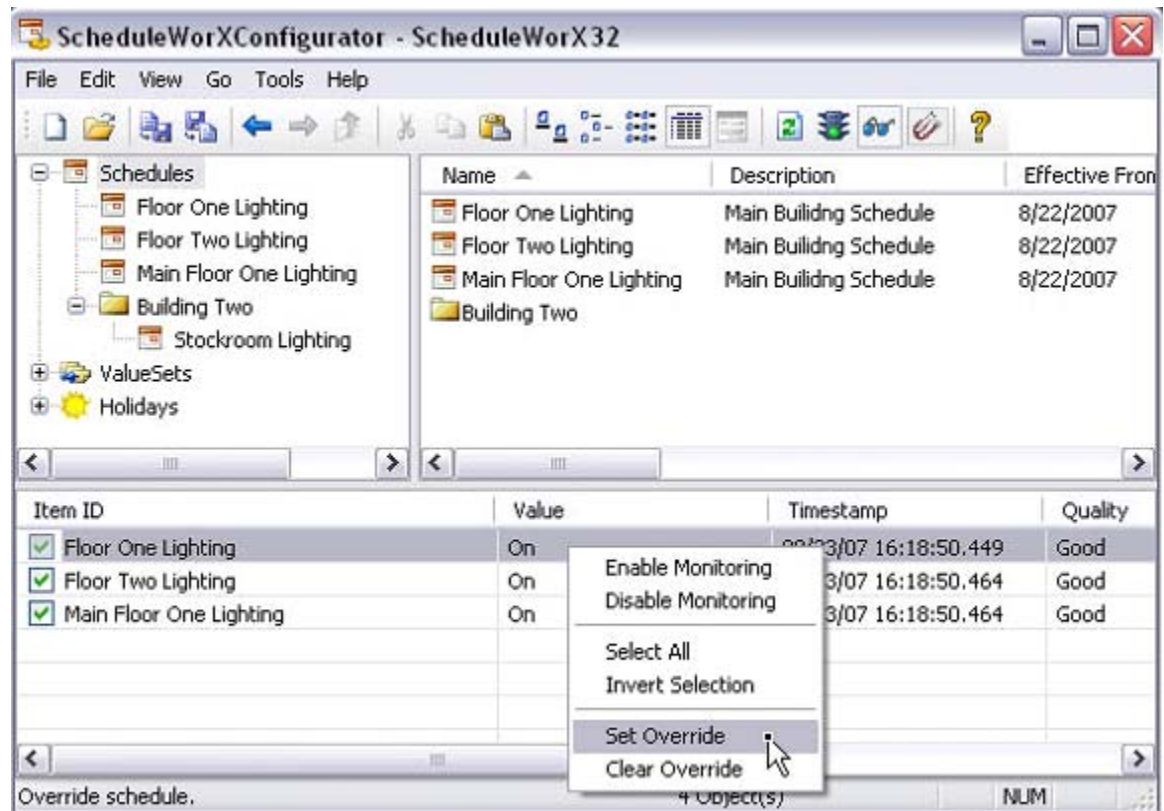
4. In either instance the **Event Properties** dialog box that you have seen previously appears. If you wish to edit the name, location, start and end time, etc. you can do so here.
5. To edit the properties of the recurring period, click the **Recurrence** button and make any changes desired in the **Appointment Recurrence** dialog box.
6. To delete a recurring event, click the **Remove Recurrence** button.
You are returned in this instance to the Event Properties dialog box. When you Remove Recurrence you delete all additional exception events, but leave the original event intact.
7. Click **OK** to return to the Exception view with the calendar showing.

Note: When you remove recurrences only the first event in the series is left on the schedule. If entered the series from another event other than the first event, that event will not appear on the calendar.

Overrides

An override is an event that takes precedence over any other event. You can apply an override in the Monitor View, as shown in the figure below. In the figure ScheduleWorX32 is in runtime with the Monitor View being the bottom pane below.

You set an override in the Monitor View pane.



To view the running schedules you need to have the parent node selected, which in this case is the Schedules parent node highlighted in the tree control (left hand pane). If you select a schedule name then you see the properties of that schedule in the detail pane (top right).

To set an override:

1. Right click on the schedule you want to override in the Monitor View and select the **Set Override** command from the context menu as shown above.
2. Enter the **Override Value** and **Override Duration** into the Override Properties dialog box as shown below.

The Override Properties dialog box.

A dialog box titled "Floor One Lighting" with a close button (X) in the top right corner. It contains two input fields: "Override Value:" with a dropdown menu showing "Off", and "Override Length:" with a dropdown menu showing "2 hours". At the bottom are "OK" and "Cancel" buttons.

Floor One Lighting

Override Value: Off

Override Length: 2 hours

OK Cancel

3. Click the **OK** button to enforce your override.

When an override is in effect you will see the Subquality value change to Local Override in the Monitor view, as shown below.

An override in effect in the Monitor View pane.

Item ID	Value	Timestamp	Quality	Subquality	Limit
☒ Floor One Lighting	Dim	08/23/07 16:53:57.605	Good	Local Override	NA
☒ Floor Two Lighting	On	08/23/07 16:18:50.464	Good	Non-specific	NA
☒ Main Floor One Lighting	On	08/23/07 16:18:50.464	Good	Non-specific	NA

Integration

Integration with the Unified Data Manager

Data that you create in ScheduleWorX32 is stored in a Unified Data Manager database and displayed in ScheduleWorX32. The UDM does not display any ScheduleWorX data or allow configuration of that data, so you should use ScheduleWorX32 for all configuration. The ScheduleWorX32 runtime engine is part of the UDM Runtime, therefore all information must be stored in the UDM database.

There are two types of schedules that are stored in the UDM database: Control Schedules and Availability Schedules.

- **Control Schedules** contain events that are assigned a value of a valueset and control a resource. Control Schedules are only available in ScheduleWorX32 and are not shown in the UDM Configurator. Control Schedules could be used to configure a set of floor lighting schedules, where you could define different lighting modes on different day and times of day.
- **Availability Schedules** are schedules that are defined for a particular resource to allow access to that resource when time permits and by order of priority. Availability schedules are displayed in the UDM for use in expressions, and are not used in ScheduleWorX32. An Availability Schedule would show the days and times a conference room, person, or other resource was booked or free.

Importing and Exporting Schedules

You can import and export data from one ScheduleWorX32 configuration to another. Exported data can serve to backup your configuration data, provide a means for transporting configuration data from one system to another (perhaps remote) system, and allow you to create and maintain different versions of your configurations for custom applications.

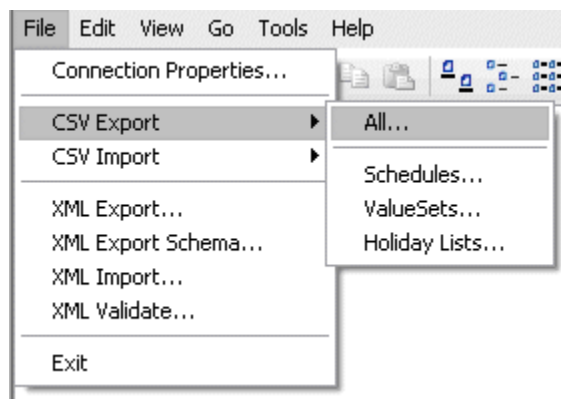
ScheduleWorX32 allows you to import and export data in either CSV (Comma Separated Values) or as XML data. The CSV export/import creates and opens text files in various interchange formats. You can work with other data formats using other delimiters. TSV (Tab Separate Values) can also be created; indeed you can use any character as your delimiter. You have the further option of importing and exporting your entire configuration, or just your schedules, valuesets, or holidays. Schedule information is exported as binary data and therefore cannot be modified in the exported format. Also, valueset data is exported in XML format, so it should not be modified in the exported file because the format could be easily destroyed.

Exporting CSV Files

To export your configuration data as a CSV or another text delimited file, do the following:

1. Click on the **File** menu, the **CSV Export** and select the type of export operation you desire: **All**, **Schedules**, **ValueSets**, or configuration data as shown below.

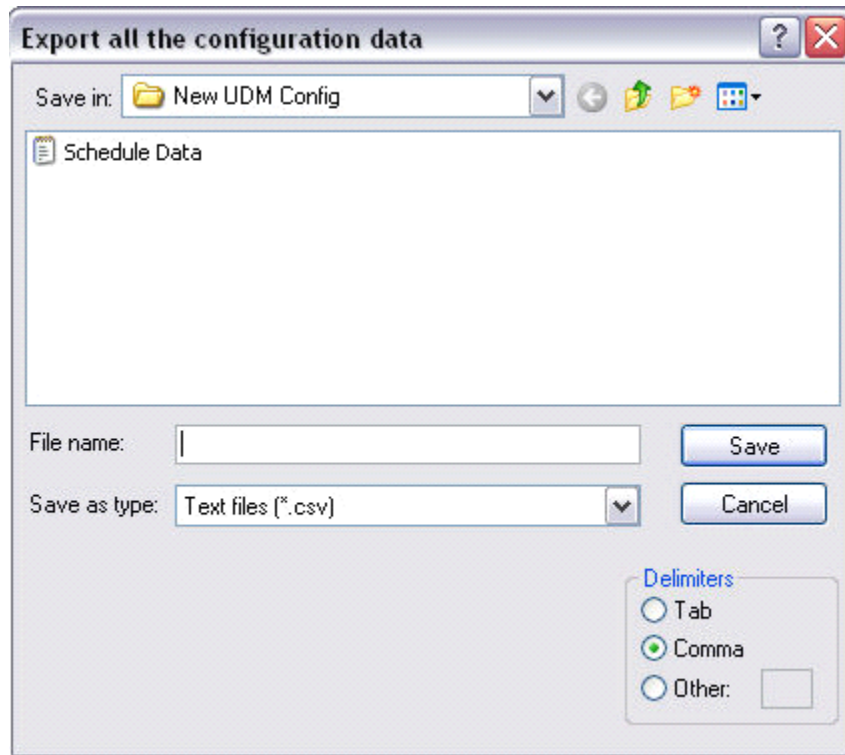
The CSV Export submenu.



The Export all of the configuration data dialog box appears.

2. **Navigate** to the folder you wish to save you file in.
3. Enter a name into the **File Name** text box.
4. Select the **file type** desired, either Text files (*.csv) or Text files (*.txt) from the Save as type list box.
5. If necessary select the **delimiter** you want your export file to have.

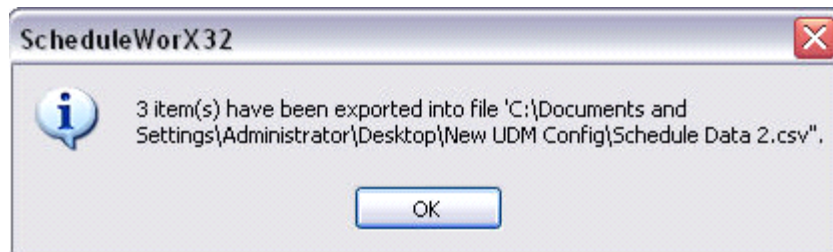
The Export All The Configuration Data dialog box.



6. Click on the **Save** button to perform the export.

ScheduleWorX32 post a confirmation message similar to the one below to indicate how many items have been exported, and the path to the export file.

The Export Confirmation message box.



A CSV file usually is associated with a spreadsheet such as Microsoft Excel, but you can open CSV files with databases, as well as opening that file type with a text editor such as Notepad. In the figure below an edited portion of a CSV export file is viewed with several different record types.

[illegible]

Importing CSV Files

You can import CSV export files into ScheduleWorX32, in part or in full. When you do so the values in the import file are added to any schedule data you have already saved to your ScheduleWorX32 database or can update pre-existing data.

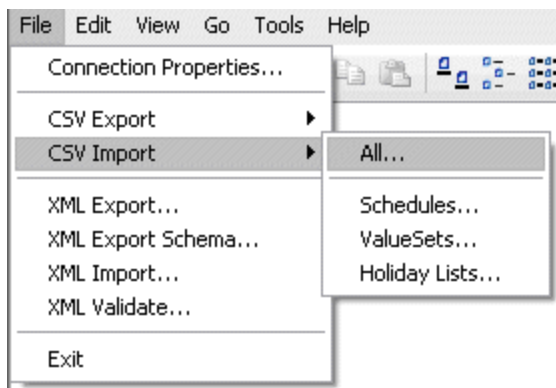
Your options in importing CSV files are:

- Import **All Data**. This imports schedules and events associated with schedules; valuesets and values; and holidays and associated holiday events.
- Import **Schedules**. This imports schedules and events associated with schedules only.
- Import **ValueSets**. This imports ValueSet and any values associated with those valuesets only.
- Import **Holidays**. This imports Holidays lists and any holiday events that are part of those lists.

To import CSV data:

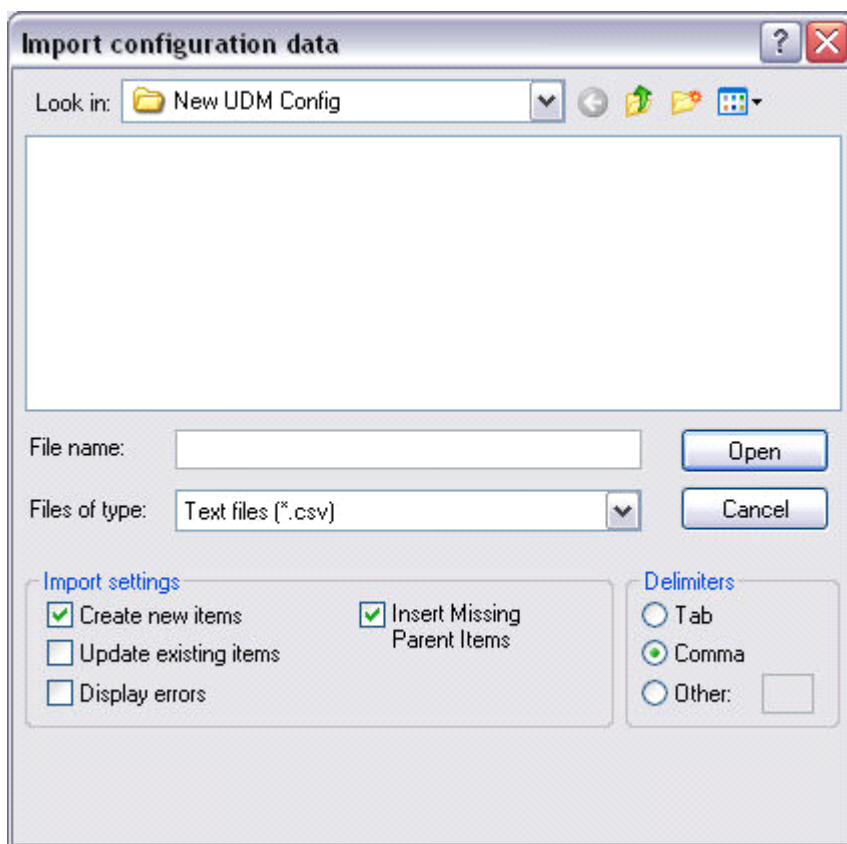
1. Click on the **File** menu, then **CSV Import**, and select the **All (Schedules, ValueSets, or Holidays)** command

The CSV Import Submenu.



The Import Configuration Data dialog box appears, as shown below.

Import Configuration Data.



2. Navigate to and **highlight the CSV** file that has the data you want to import.
3. Set the **Import Settings**, as follows:

Enable **Create new items** if you want any new data added to your current records. If a record already exists the new data is added with the data name incremented by a number. For example, if Holiday List exists the imported record would be called Holiday List 2.

Enable **Update existing items** if you want matching records to overwrite their counterparts in the file you are importing to.

Enable **Display errors** to see a message box with any records that couldn't be created or update.

Enable **Insert Missing Parent Items** to create the folder or node of a data item so that its full tree control path exists as it does in the import file.

4. Click the **OK** button to complete the import.

ScheduleWorX32 posts a confirmation alert box that tells you the number of records that have been imported.

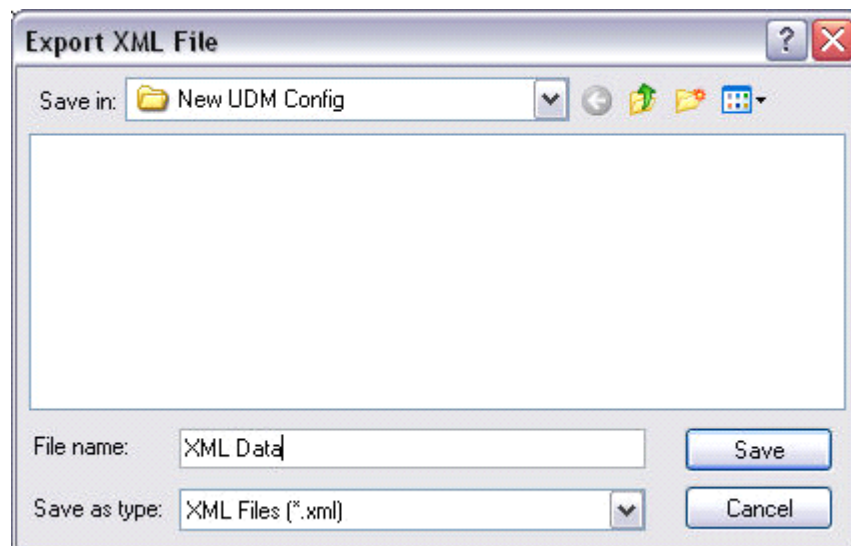
Exporting XML Files

You can export data to XML files, which makes a convenient interchange format for many applications. Unlike CSV or other Text files such as TSV, XML files can be exported as data files or just the XML schema can be exported. XML data contains the same information that Text files contain, but in the XML format.

To export ScheduleWorX32 data and schema to an XML export file:

1. Click on the **File** menu and select the **XML Export** command.

The Export XML File dialog box.



2. Enter the **File Name**, navigate to the **location** you wish to save the XML file to; then click the Save button.

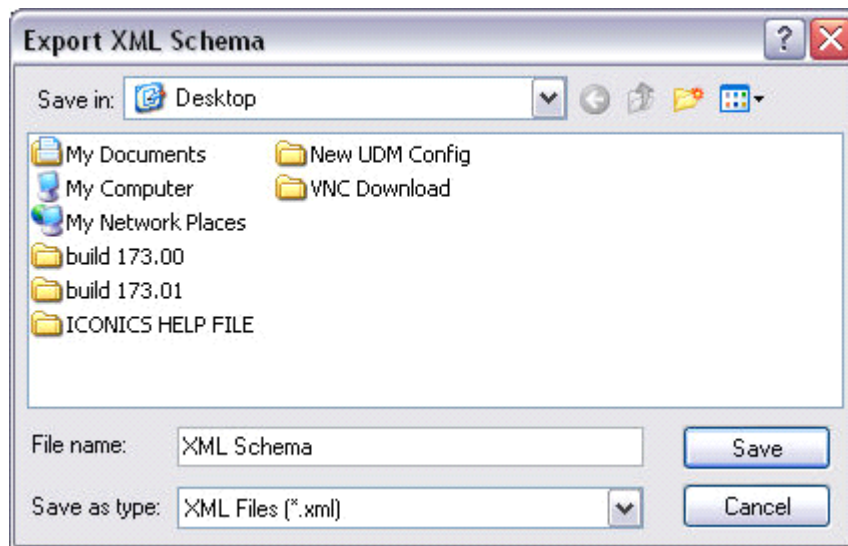
Export XML Schema

XML schema only contain the structure of the data in ScheduleWorX32. You can use the XML Schema as a recipe or template that you can add data to in other applications. If you add XML data to an XML schema that you've imported from ScheduleWorX32 you can at a later time import the XML schema with that additional data.

To export an XML schema file:

1. Click on the **File** menu and select the **XML Export Schema** command.

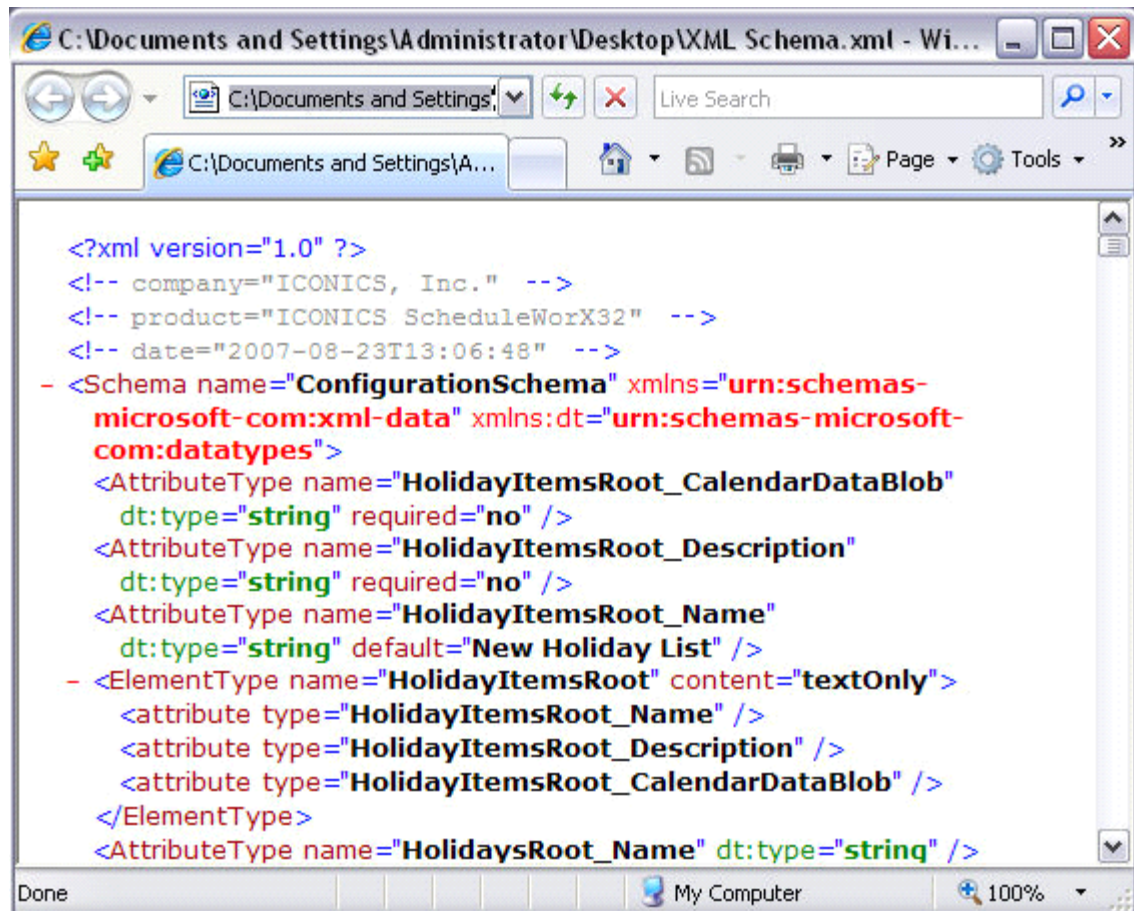
The Export XML Schema dialog box.



2. Enter the **File Name**, navigate to the **location** you wish to save the XML file to; then click the Save button.

You can view the XML Schema inside whatever application you have associated with XML. For example, in the figure below an XML schema is displayed inside Microsoft Internet Explorer. If you open an XML schema file

An XML schema from ScheduleWorX32 shown in Microsoft Internet Explorer.



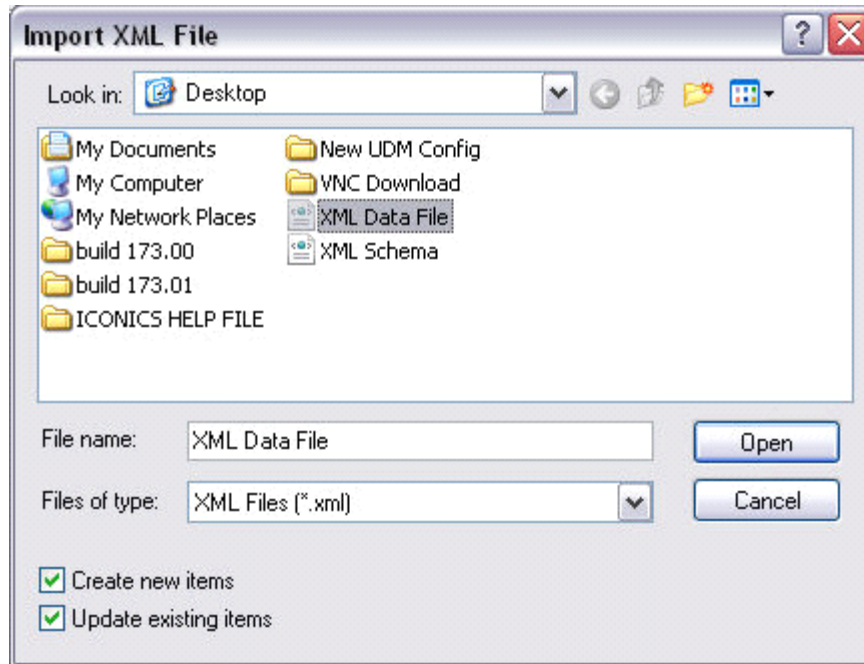
Import XML File

You can import data from an XML file into ScheduleWorX32. XML offers a good interchange format, and allows you to work with ScheduleWorX32 data in other applications.

To import an XML file:

1. Select the **Import XML** command from the **File** menu.
2. Navigate to the XML file you want to import and **highlight** that file.
3. Enable or disable the options for importing the data: either **Create new item** or.

The Import XML File dialog box.



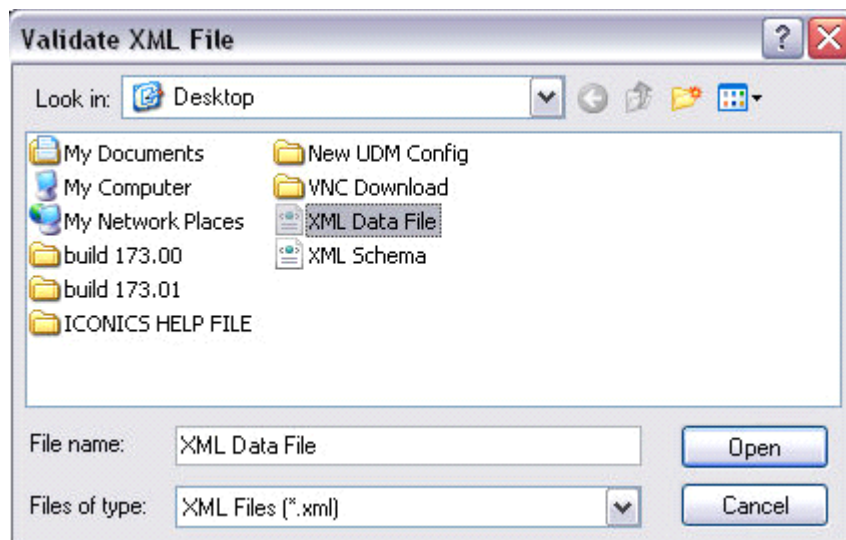
Validate XML File

ScheduleWorX32 has an XML validate function that will tell you if your file has all of the necessary elements to be imported. Validation does not evaluate the data contained in an XML file, only the syntax of the XML tags and the document format. There are no options, and the validation will either succeed or fail and post an alert box to indicate which condition was detected.

To validate an XML file:

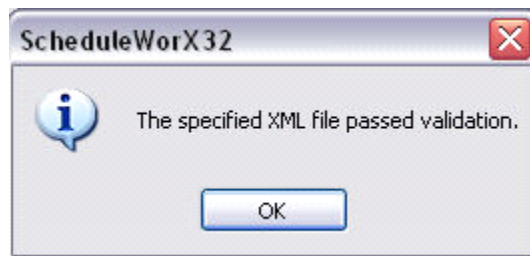
1. Select the **XML Validate command** from the **File** menu In the Validate XML File dialog box shown below you wish to import.

The Validate XML File dialog box.

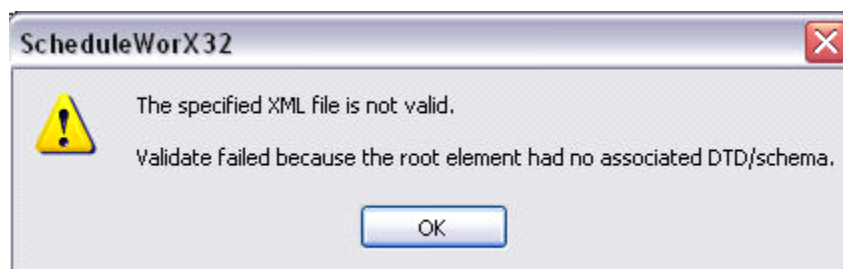


2. Click on the **Open** button to perform the validation.

A successful validation will show the dialog box shown below.

Successful Validation confirmation box.

An unsuccessful validation shows a message like the one shown below. In some instances the validation engine will indicate the reason that the file was rejected a being a valid XML file.

Unsuccessful Validation alert box.

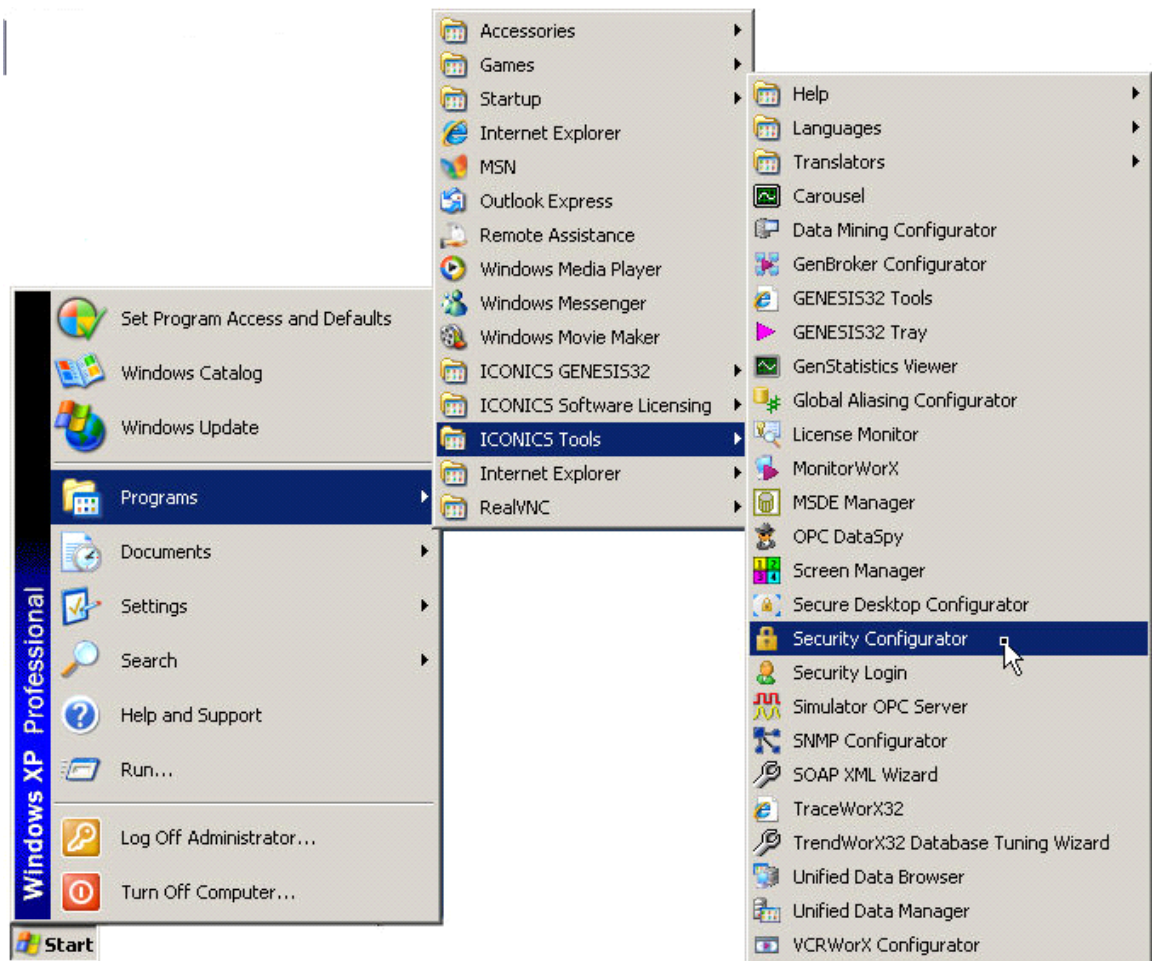
Security

ScheduleWorX32 uses the Iconics Security Server to set permissions and access by user and group. The users and groups are those defined within the ICONICS Security configurator, and aren't Windows NT Users and Groups, unless explicitly configured as such in the Security configurator. For instructions on creating and working with GENESIS32 Users and Groups within the Security configurator, consult the on-line help system for that application.

To open the Security Server:

1. Click on **Start**, **Programs**, **ICONICS Tools**, and then select the **Security Configurator** as shown below.

The Security Configurator Command.



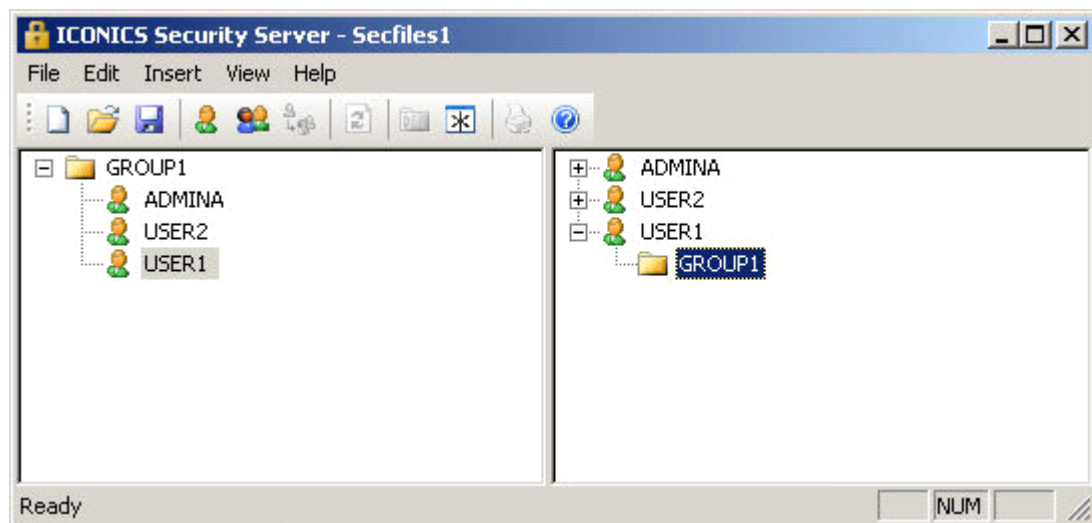
2. Enter your **User Name** and **Password** into the ICONICS Security Server Administrator Login.
3. Then click the **OK** button.

The ICONICS Security Server Administrator Login.



The ICONICS Security Server opens as shown below. In the left pane is a listing of defined Groups and the Users who are part of each group. In the right pane is a listing of Users and the Groups that they are members of.

The ICONICS Security Server



Users and Groups

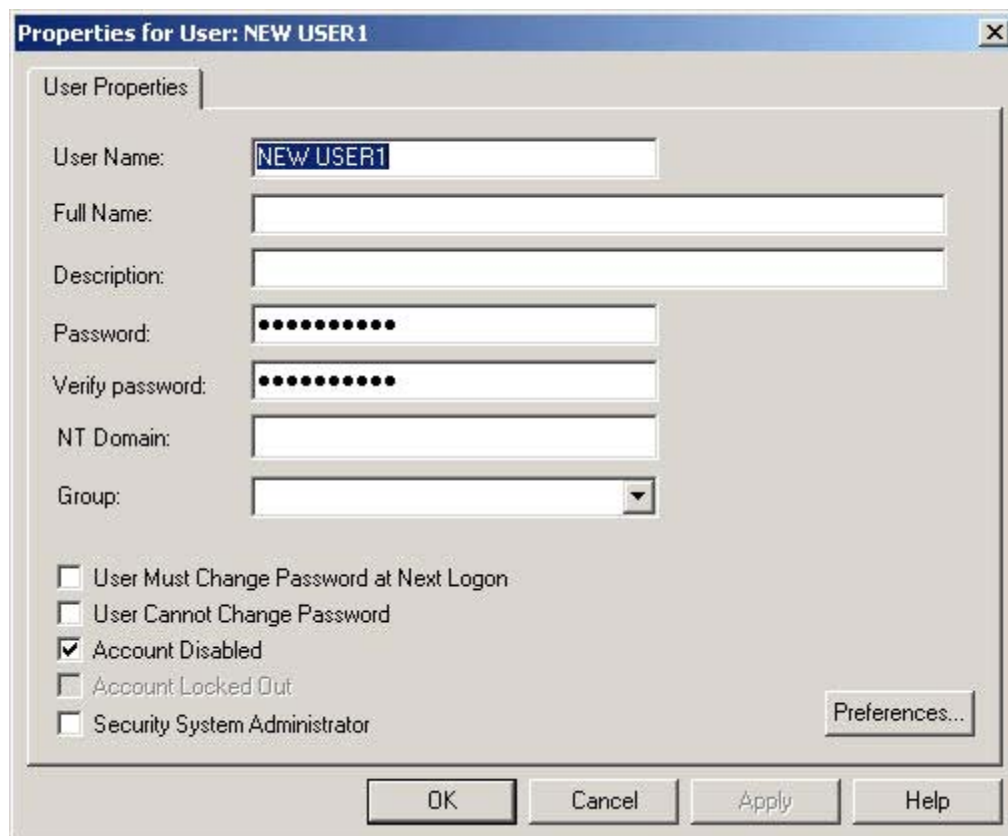
When ICONICS GENESIS32 evaluates the access and privileges a user has working in ScheduleWorX32 it assigns to that user the highest possible privilege that either the user or any group that the user belongs to have. That is, rights are granted to a user based on a logical OR operation. If you intend to deny a user the rights to access a particular feature in ScheduleWorX32 you need to not only consider the user's rights, but all of the groups the user belongs to as well. Access by group can defeat restriction by user if you are not careful.

One way around this problem is to define a group(s) for ScheduleWorX32 access only. ScheduleWorX32 Operators, for example, might not have the ability to run ScheduleWorX32, and must view schedules through GraphWorX32 using the ScheduleViewer ActiveX.

To create a new group or user in ScheduleWorX32:

1. Click the **Insert** menu, then select either the **New User** or command.
Or, click the New User icon  or New Group icon  on the toolbar.
2. For a New User **enter the information** about the GENESIS32 User account in the Properties for User dialog box as shown below.

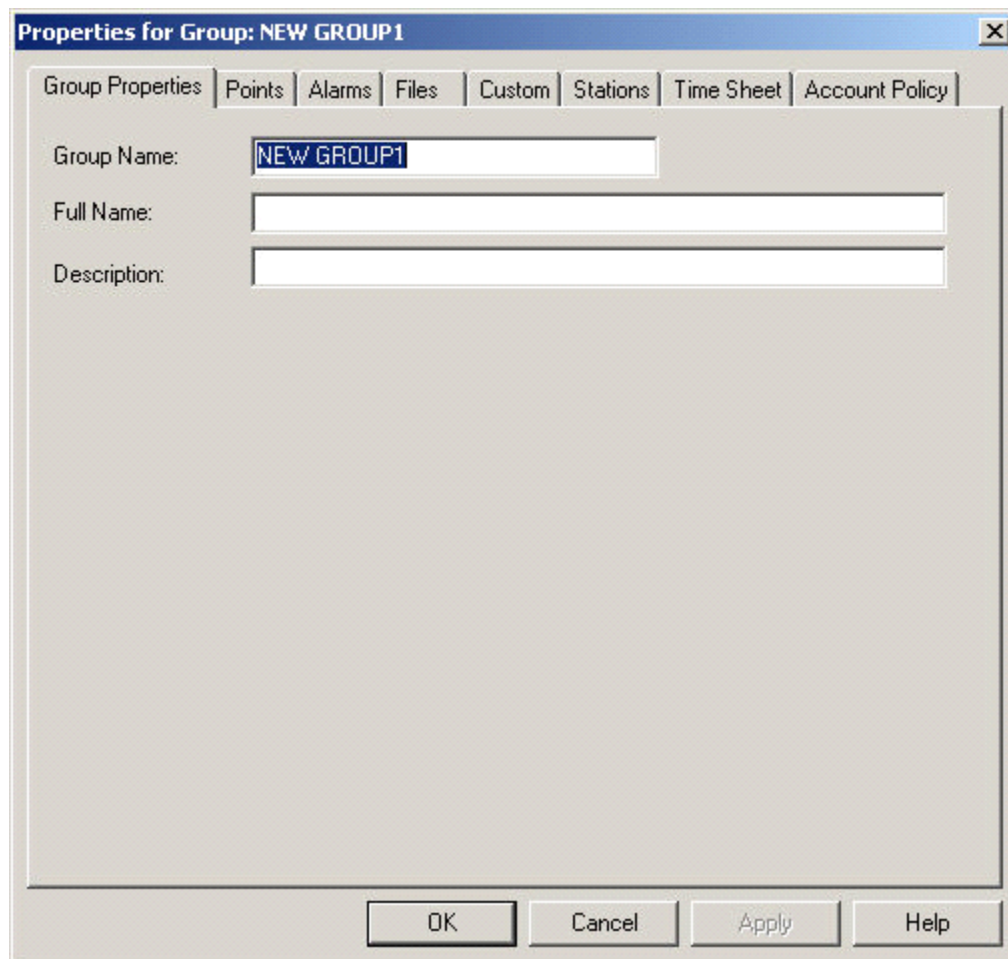
Properties for User dialog box.



The image shows a Windows-style dialog box titled "Properties for User: NEW USER 1". It contains several input fields and checkboxes. The "User Name" field is filled with "NEW USER1". The "Full Name" and "Description" fields are empty. The "Password" and "Verify password" fields are filled with dots. The "NT Domain" field is empty. The "Group" field is a dropdown menu. Below these fields are five checkboxes: "User Must Change Password at Next Logon" (unchecked), "User Cannot Change Password" (unchecked), "Account Disabled" (checked), "Account Locked Out" (unchecked), and "Security System Administrator" (unchecked). There is a "Preferences..." button to the right of the checkboxes. At the bottom are "OK", "Cancel", "Apply", and "Help" buttons.

3. To create a new group, enter the properties for that group in the **Properties for Group** dialog box.

Since users can gain access to ScheduleWorX32 based on their GENESIS32 user account, creating new user accounts is generally not as effective as creating a ScheduleWorX32 group(s).

Properties for Group dialog box.

The image shows a Windows-style dialog box titled "Properties for Group: NEW GROUP1". It features a tabbed interface with the following tabs: "Group Properties", "Points", "Alarms", "Files", "Custom", "Stations", "Time Sheet", and "Account Policy". The "Group Properties" tab is currently selected. Within this tab, there are three text input fields: "Group Name:" (containing "NEW GROUP1"), "Full Name:" (empty), and "Description:" (empty). At the bottom of the dialog, there are four buttons: "OK", "Cancel", "Apply", and "Help".

4. Click **OK** to return to the Security Configurator and create the new user or group.

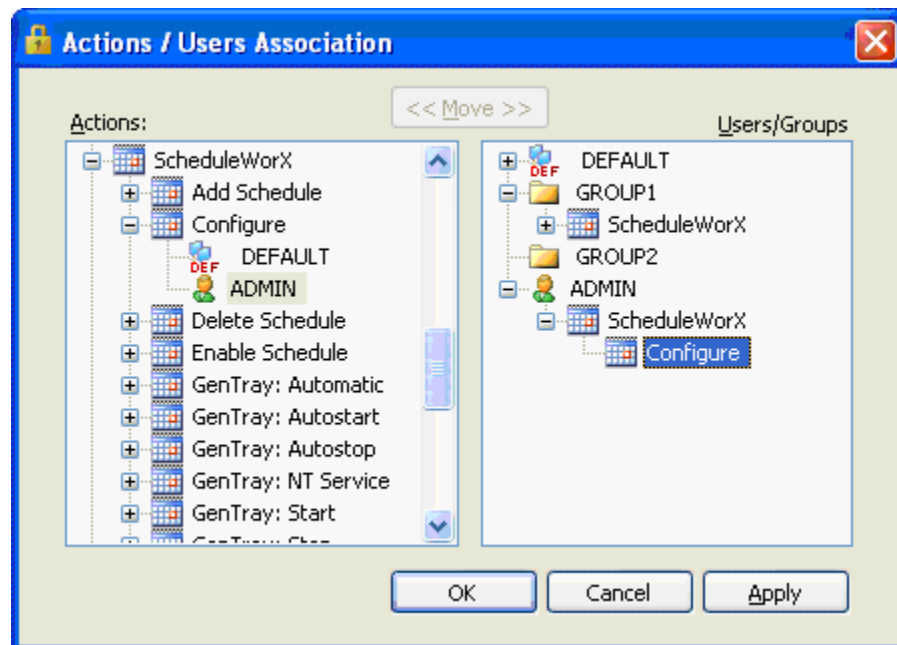
Setting Action Privileges

You can modify the actions that users and groups can perform in ScheduleWorX32 by changing the Actions/Associations in the Security Configurator. For modifications to group associations the Security Configurator can be in basic or advanced mode. For modifications to user associations the Security Configurator must be in advanced mode.

To alter a user or group's allowed actions:

1. Click on the **Start** menu, then on **All Programs, ICONICS Tools**, and select the Security **Configurator** command.
2. **Log into** the Security Configurator with your GENESIS32 User ID and Password.
3. Click on the **Edit** menu and select the **Application Actions** to open the Actions/Users Association dialog box.
4. Or, click on the Application Actions button on the Security Configurator toolbar.

The Actions / User Association dialog box.

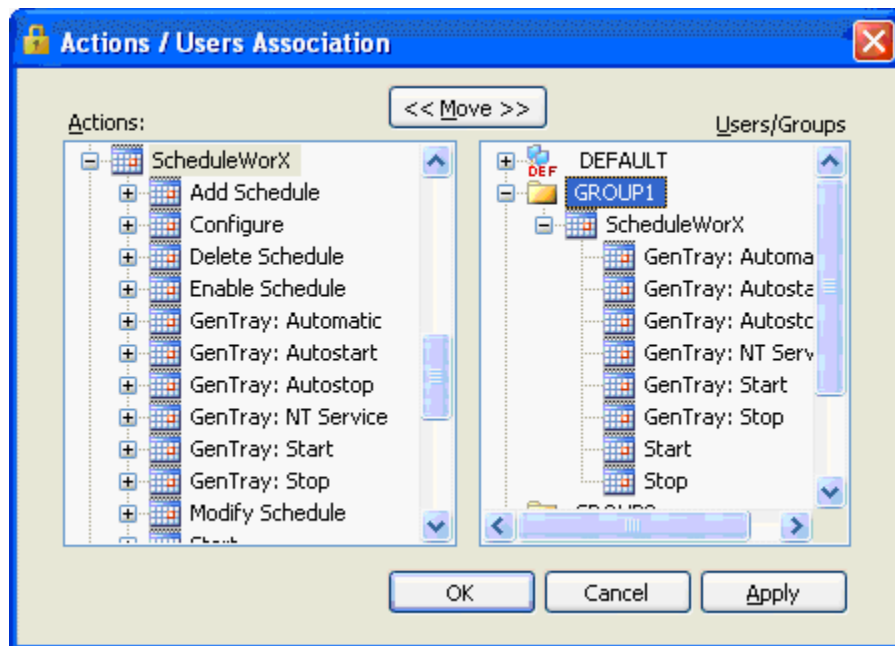


The Security Configurator can be in either advanced mode where user and group actions can be modified, or in basic mode where only groups can have their actions modified. Shown above is the advanced mode.

5. Click on the **Group** in the Users/Groups tree control that you want to alter, then scroll down to view the **ScheduleWorX32 node**.
6. **Highlight** the action you wish to remove; then press the **Delete** key.
7. Continue to delete any additional actions, as desired.

The figure below shows the configuration you might want for an operator group where Add Schedule, Configure, Delete Schedule, Enable Schedule, and Modify Schedule have been removed.

A set of actions that an operator group might have.



8. If you make a mistake, **highlight the action** in the Actions tree control (left) and with the group that the action will be added to highlighted in the Users/Groups tree control click the **Move** button.
9. Click the **OK** button to set the security rights.

GraphWorX32 Schedule Display

You can create a GraphWorX32 display of your schedules using the ScheduleWorX32 and Tree Control ActiveX controls. This display can show either local or remote schedules, allow you to switch between schedules, filter based on schedule type (weekly, exception, and so forth), and alter schedule data. This section shows you how to create a basic schedule display inside GraphWorX32.

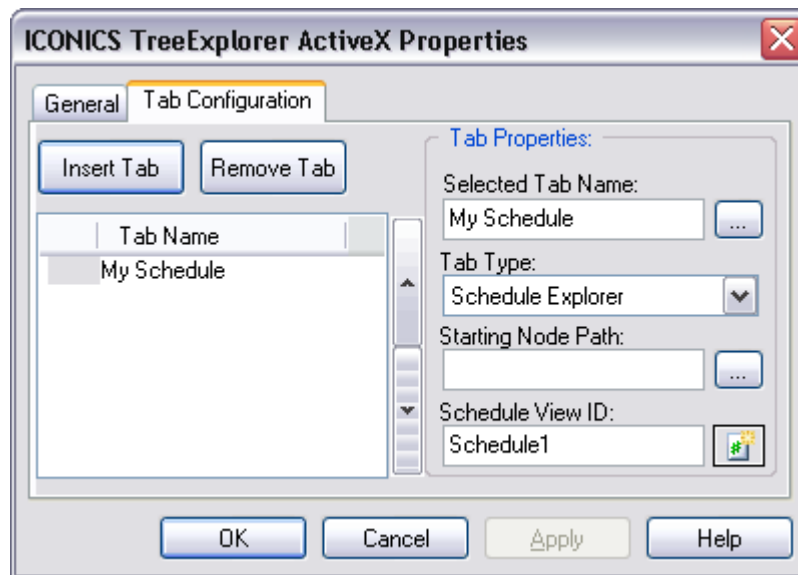
To create a GraphWorX32 schedule display:

1. **Launch** GraphWorX32 and **create** a new display.
2. Click on the **ScheduleWorX** toolbar button to insert a ScheduleWorX ActiveX container on the design surface.
3. Click on the **Tree Explorer Control** toolbar button to insert a tree control ActiveX into GraphWorX32's display.
4. **Double click on the tree control** to open the Tree Explorer ActiveX Properties dialog box.
5. Enter the **name** of your schedule in the Tab Name text box
6. Or, click on the **Ellipse button** to the right of the Selected Tab name text box, and then select a Global Alias or Language Alias from the Unified Data Browser.
7. Select **Schedule Explorer** in the Tab Type drop down list.
8. To select a remote schedule server or a subfolder click on the **Ellipse** button next to the Starting Node Path text box and select the ScheduleWorX **data node** from the Unified Data Browser.
9. Type in a Schedule View ID, or click on the **New** button to the right of the Schedule View ID text box and select the Schedule ID from the Unified Data Browser.

The Tree Explorer ActiveX Properties dialog box appears as shown in the figure below.

10. Click the **OK** button
11. Double **click** on the Schedule Viewer control to open the Schedule Viewer ActiveX Control Properties dialog box
12. Select the **Schedule View ID** from the drop down list. This should be the same ID as the one used in the Tree Explorer ActiveX, as shown below.

Tree Explorer ActiveX Properties dialog box.



13. Click the **OK** button

14. Select the **Save** command from the File menu, enter **a file name** and then click the OK button to save your GraphWorX32 display.

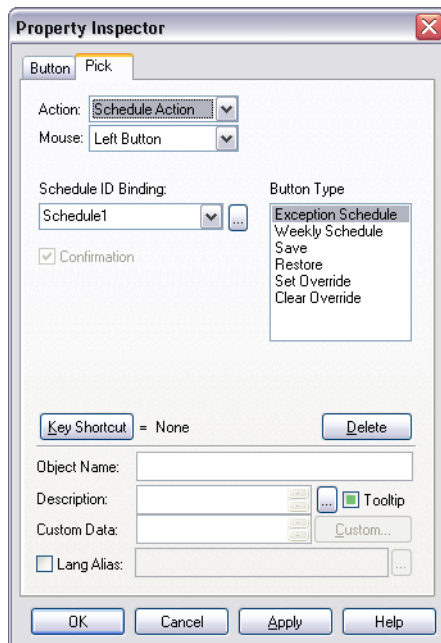
At this point you have a working Schedule display that you can place into runtime using the Runtime menu item in GraphWorX32. In order to control your schedule(s) you can place buttons with schedule pick actions on the display.

Pick Action Buttons

To add scheduling buttons to a GraphWorX32 display:

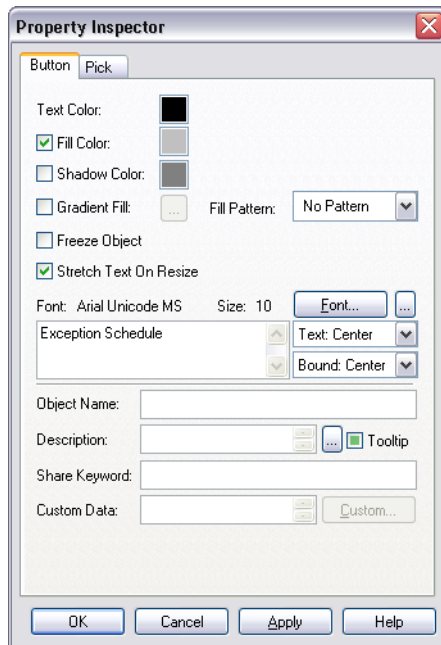
1. Click on the **Button** button on the GraphWorX32 toolbar.
2. **Double click** on the button to open the Property inspector; then click on the **Pick** tab.
3. Select **Schedule Action** from the Action drop down list.
4. **Confirm** that your **Schedule ID Binding** is the same as the one you selected for the Tree Explorer control.
5. Click on the **Exception Schedule** in the Button Type list, as shown in the figure below.

Button Pick Actions in the Properties Inspector.



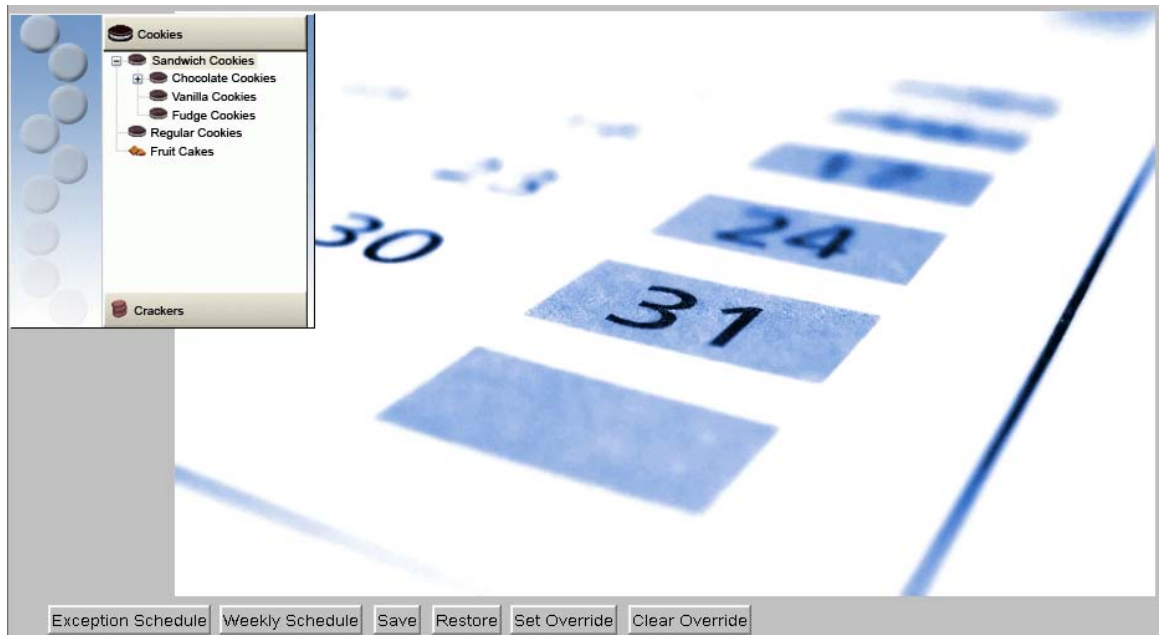
6. Click on the **Button** tab and **enter the name** of your button as is shown for the Exception Schedule button in the figure below, then click the **OK** button.

Naming a Button on the Button tab of the Properties Inspector.

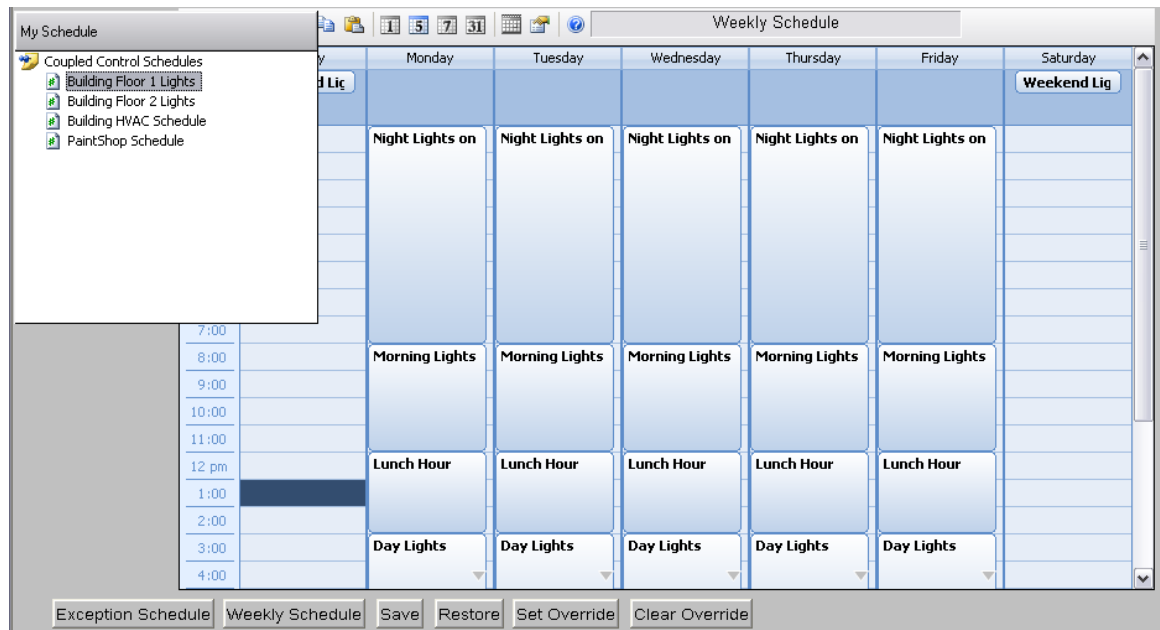


7. **Duplicate the first button** you made to create the: Weekly Schedule, Save, Restore, Set Override, and Remove Override buttons so that you have a button bar that looks like the one shown below.
8. Double click the new buttons to **open and modify** their properties.
9. **Save** your GraphWorX32 display. The figures below show the display in configuration and runtime.

The Schedule shown in configuration mode.



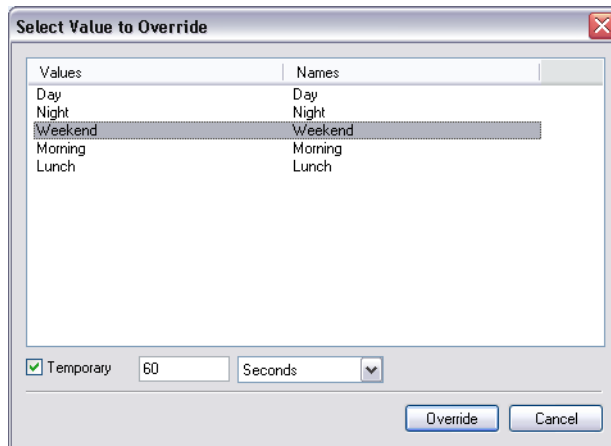
The Schedule shown in runtime mode.



Each of the buttons has either settings or confirmations associated with the actions that they define. The buttons have the following affect on what you see in your schedule:

- **Exception Schedule button.** This button filters the display so that you see only exceptions on your display.
- **Weekly Schedule button.** This button refreshes the display and shows the currently defined weekly schedule.
- **Save button.** The Save button saves any changes you made to the schedule back to the UDM database.
- **Restore button.** The Restore button refreshes the display with the current saved information in the UDM database. If you made changes to your schedule and did not save those changes then restore replaces that information. If you made changes to your schedule and did save them, then restore leaves your changes intact.
- **Set Override button.** You can set an override to a schedule with this button. The Select Value to Override dialog box is displayed as shown in the figure below. For more information about overrides, refer to the Override topic. You can enter a delay and set it to temporary if desired.

The Select Value to Override dialog box.



- **Remove Override.** Click this button to remove the current override. A confirmation dialog box will appear. If there is no current override this button has no action.

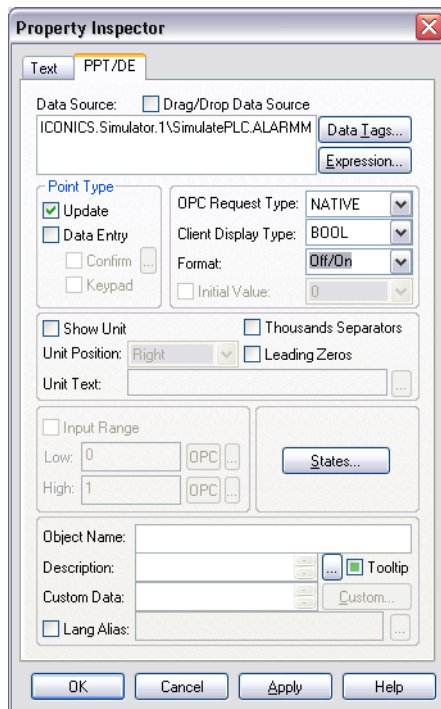
Process Point Display

You may wish to add a process point to the ScheduleWorX display in GraphWorX32 so that you can see what the current value of a schedule is. For Boolean tags this can be a 1 or 0; but you can change the tag to read On or Off, Red or Green, or whatever.

To set a process point:

1. In the **configuration mode** click on the **Process Point** button on the toolbar and **click** on the display at the point where you want the data to be displayed.
2. In the Property Inspector **select the tag** that controls your schedule; then select the output **Format** from that drop down list. In the figure below the display is set to On/Off.

The Property Inspector dialog box for the placed process point.



3. Click the **OK** button.
4. Click the Text label button and then click and enter the text you want to have as a label. The figure below shows the process point operating in runtime. Light 1 Status: is the label, and On is the data from the tag.

The process point in runtime.

