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User's Guide

# GoldSim Player



GoldSim 15

**GoldSim**



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# GoldSim Player User's Guide

**The play is the thing.**

**William Shakespeare**

## Introduction

GoldSim is a user-friendly, highly graphical, object-oriented program for carrying out dynamic, probabilistic simulations to support management and decision-making in engineering, science and business.

Models created using GoldSim can be saved as Player files (with a .gsp extension) that can subsequently be viewed (and in some cases, modified and run) using a separate program, the GoldSim Player. This short document describes the GoldSim Player. The GoldSim Player can be downloaded for free from the GoldSim website ([www.goldsim.com](http://www.goldsim.com)).

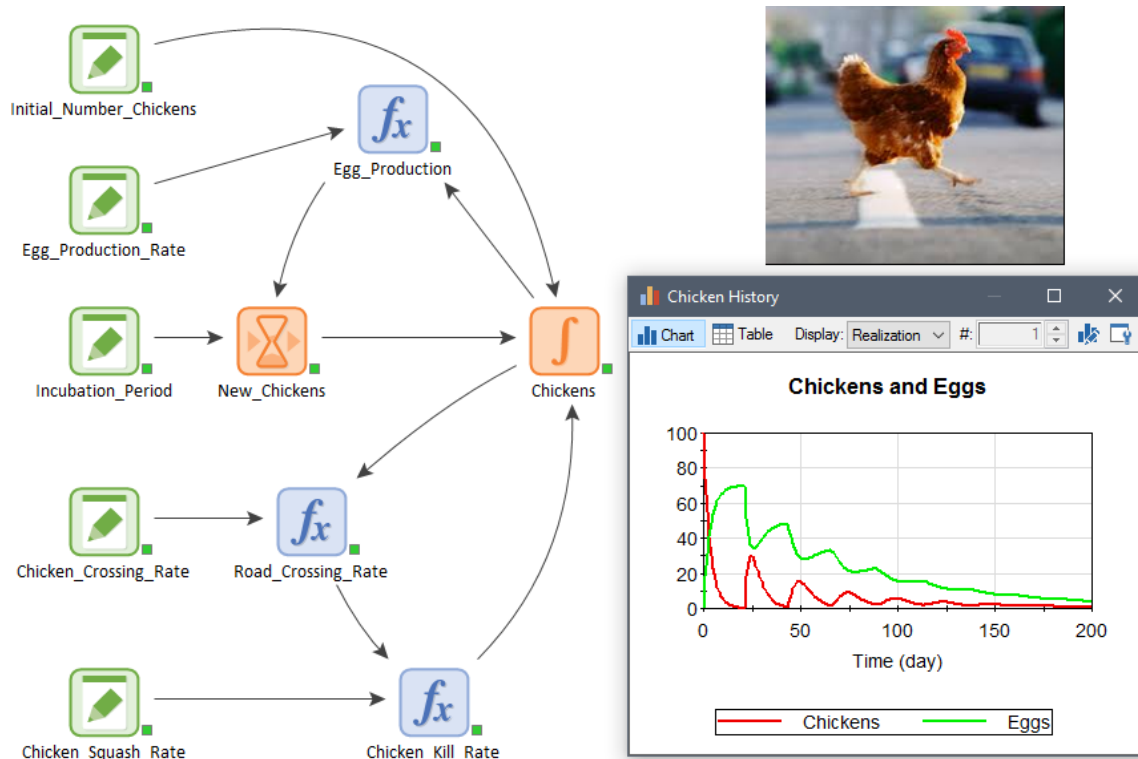
For the most part, use of the GoldSim Player is self-explanatory, and a well-designed Player file provides all the instructions required to view and run the file.

This brief document describes use of the GoldSim Player in detail, and discusses the following topics:

- What is the GoldSim Player?
- Installing and Starting the Player
- Types of Player Files
- Viewing Player Files
- Basic GoldSim Concepts
- Running Player Files
- Using the GoldSim Player as a Client
- Running the Player from the Command Line
- Building Models in GoldSim
- Technical Support

## What is the GoldSim Player?

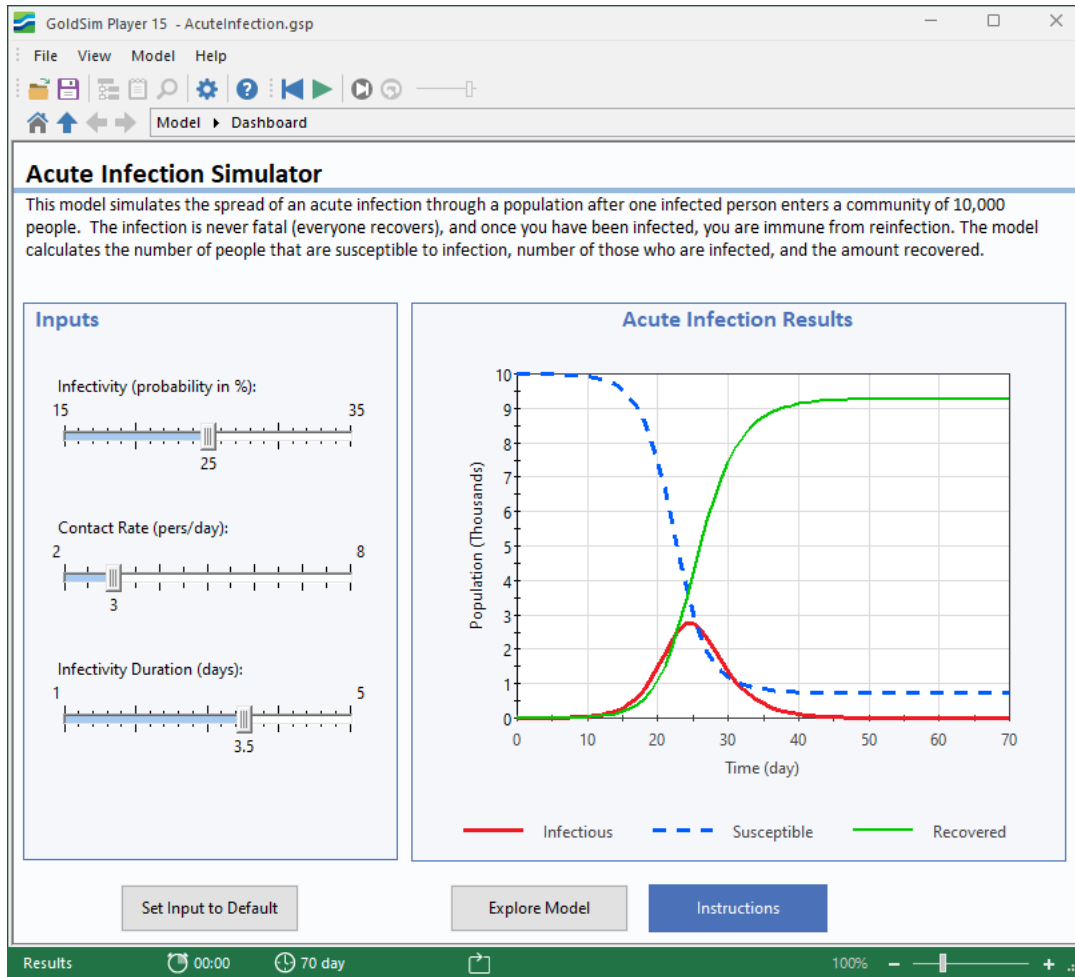
GoldSim is a highly graphical, object-oriented computer program for carrying out dynamic, probabilistic simulations. In a sense, GoldSim is like a "visual spreadsheet" allowing you to visually create and manipulate data and equations.



The GoldSim Player is a special version of GoldSim that allows you to "play" or "read" an existing GoldSim model without having to license the GoldSim software. In general, the user interface for the GoldSim Player is identical to that of the full GoldSim version, with menu options and controls for editing the model removed or disabled. You can view and navigate any GoldSim model using the GoldSim Player. This allows a modeler to distribute a model to others without requiring them to license GoldSim.

By using the GoldSim's Dashboard Authoring features, a GoldSim modeler can construct a "dashboard" interface for models. Dashboards are "control panels", with buttons, checkboxes, combo boxes, sliders, result displays and other controls, through which you can control and view the results of a GoldSim model within the GoldSim Player. A simple example of a Player file with a Dashboard is shown below:





This manual provides all the information you need to use the GoldSim Player to view and run GoldSim models. If you are interested in learning more about how GoldSim models work, and/or you want to build your own models in GoldSim, a section at the end of this manual tells you how you can obtain further information.

**Read More:** *Learning More About GoldSim* on page 28

**Note:** In addition to viewing Player files, the GoldSim Player can also be used as a Client when using the GoldSim Distributed Processing Module. If you want to use the Player as a Client, read “Using the GoldSim Player as a Client”.

**Read More:** *Using the GoldSim Player as a Client* on page 26

## Installing and Starting the Player

The GoldSim Player is available as a free download at the GoldSim website (<https://www.goldsim.com/Web/Products/GoldSimPlayer/>).

**Note:** When downloading the GoldSim Player from the website, please remember to enter your email address. We will then inform you whenever a new version of the Player is available. GoldSim is updated regularly, and the GoldSim Player cannot read a Player file if it was created with a version of GoldSim that is more recent than the Player version.

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Once the Player installation file has been downloaded, simply double-click on it and follow the instructions on the screen in order to install it.

After installing the Player, you can start the program by double-clicking on the program icon (in the folder in which it is installed) or by single-clicking on the GoldSim Player in the Start Menu (the installation will place the Player on the Start Menu under Programs).

When you do so, the following screen will be displayed:



To open a Player file, select Open Model. If you have already opened a file in the Player, selecting Recent Models lists the most recent Player files that you viewed. Player files have a “gsp” extension (e.g., Example.gsp).

You can also open the Player by double-clicking on a Player file within Windows Explorer. In this case, the opening screen shown above will be bypassed and the Player file will be directly opened.

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**Note:** When the Player is installed on your machine, a folder named "Player Examples" will also be installed (the default location is C:\Program Files (x86)\GTG\GoldSim Player XX.X if only the Player is installed and C:\Program Files (x86)\GTG\GoldSim XX.X if GoldSim is installed). This folder contains several example Player files which you can browse and run.

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## Types of Player Files

There are two types of Player files (\*.gsp) that can be created by GoldSim and viewed in the GoldSim Player:

**Player Files with Dashboards:** Player files with Dashboards have a custom-designed interface that typically looks like a "control panel", with buttons, check boxes, combo boxes and other controls. The author of the Player file will typically embed instructions, tool-tips and graphics to provide instructions on the use of the model. Player files with Dashboards typically allow you to modify some of the inputs to the model, run the model and view results. If the Player file is well-designed, you do not need to understand anything about GoldSim or the underlying simulation model in order to view and interact with such a file. You can view the underlying details of the model in the Player if you wish to (and the author of the model has allowed you to do so), but it is typically not necessary, as the Dashboard(s) will provide the primary interface to the model.

**Player Files without Dashboards:** Player files without Dashboards allow you to directly view the underlying details of GoldSim model (and provide no other interface). If the model contains results, you can view these results. You cannot, however, modify the model in any way. Although this manual provides basic instructions for navigating such a model in the Player, in order to fully understand a model without Dashboards, you will typically need to know something about the basics of the GoldSim simulation environment and the underlying simulation model itself.

**Read More:** *Basic GoldSim Concepts* on page 8; *Learning More About GoldSim* on page 28

When a GoldSim author creates a Player file, they can decide whether or not the Player user can run the model. If the model can be run, a Run button will be available in a toolbar at the top of the Payer window. If the model cannot be run, the Run button will be grayed out.

**Read More:** *Running, Pausing and Stepping Through a Simulation* on page 18

## Viewing Player Files

Using the Player to view a model is straightforward. A well-designed and documented Player file should be largely self-explanatory. This is particularly the case for Player files with Dashboards. If you want to view and navigate the underlying model (which is all that you can do if the Player file does not have a Dashboard), however, you will need to know something about the basics of the GoldSim simulation environment.

### Viewing Player Files with Dashboards

Player files with Dashboards have an interface that typically looks like a "control panel", with buttons, check boxes, sliders, combo boxes and other controls.

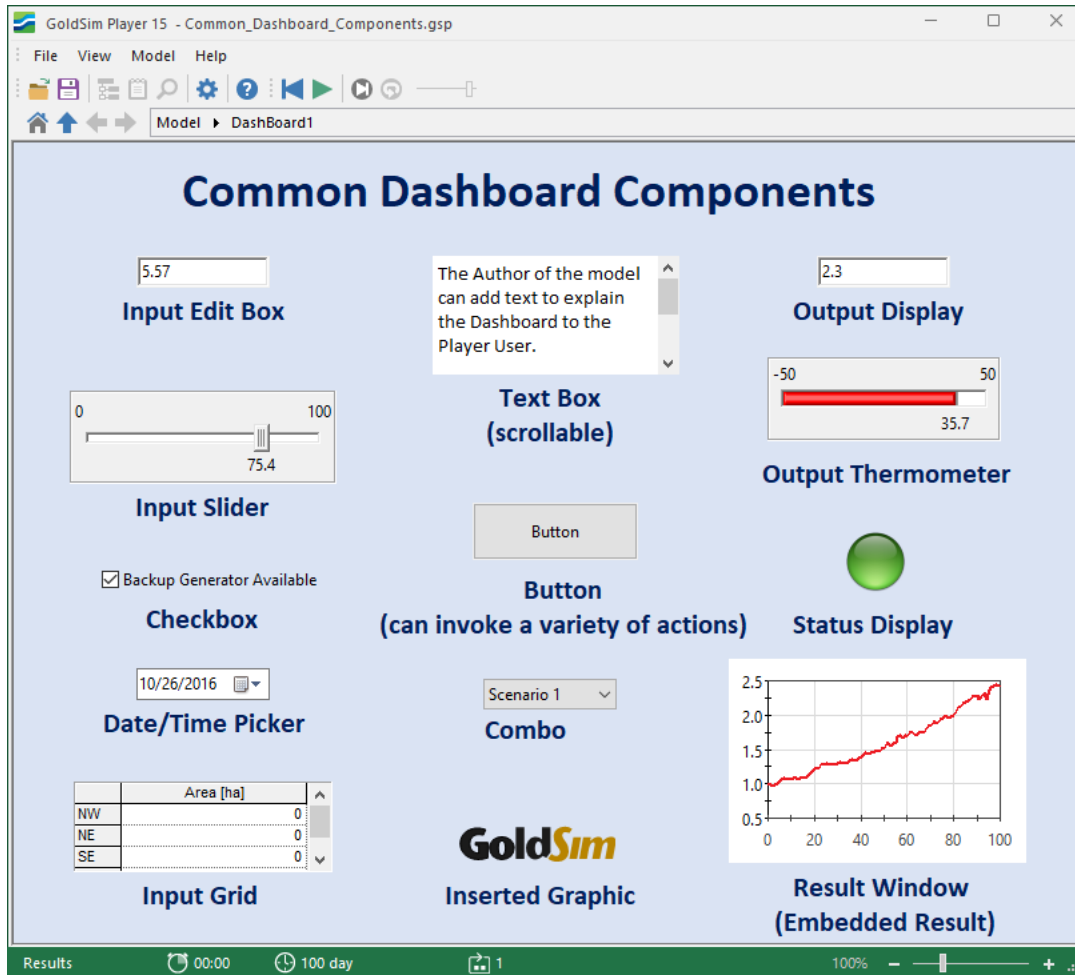
The author of the Player file will typically embed instructions and graphics to provide instructions on the use of the model, including how to navigate the model, change parameters, run the model and view results.

You can close a Player file from within a Dashboard by clicking on the **X** in the upper right-hand corner of the window. (In some Player files, the author may also have provided a button in the Dashboard itself to close the file).

**Read More:** *Running, Pausing and Stepping Through a Simulation* on page 18

### Using Dashboard Controls

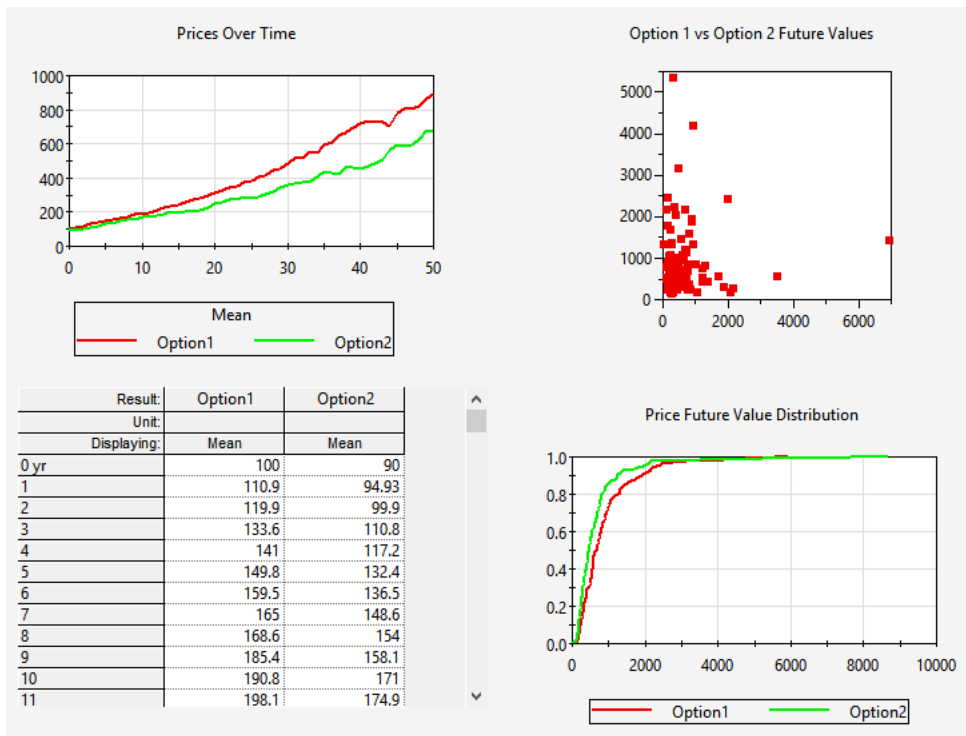
When the author of a Player file adds a Dashboard to the file, he/she adds various controls which you can use to interact with the model:



Input controls (e.g., edit boxes, sliders, and checkboxes) allow you to modify inputs to the model. For the most part, the use of these controls is self-explanatory (and a well-designed Player file will have surrounding text and/or a tool-tip that describes each control). Two points regarding the use of input controls are worth noting here:

- Right-clicking in an input box provides access to a menu for cutting, pasting and editing entries (numbers) in the control;
- Right-clicking in a slider control pops up a small edit field which allows you to enter a precise value.

Output controls display model outputs. Some outputs controls (e.g., Output Displays) simply display the result as a value. Others (e.g., Output Thermometer, Status Display) display the result graphically. Result Window controls directly show a chart (or table) of results directly in the Dashboard:



If the author allows it, double-clicking on a Result Window in a Dashboard "pops-out" a larger and more detailed version of the chart or table:



Button controls can have a large variety of actions. In a well-designed Player file, the action controlled by the button is well indicated (by the button caption and the button's tool-tip).

## Exploring the Underlying GoldSim Model

In Player files without Dashboards, and Dashboarded models that the author allows you to browse, you can explore the structure of the underlying GoldSim model from which the Player file was built.

In such a case, the GoldSim Player interface is almost identical to the interface you would see if you were running GoldSim itself. You can navigate through the model just as a GoldSim user would, moving between GoldSim Containers, viewing property dialogs, and displaying results. Note, however, that you cannot edit the model in any way.

In order to navigate and explore the underlying GoldSim model, an understanding of some basic GoldSim concepts is required.

**Read More:** *Basic GoldSim Concepts* on page 8

## Basic GoldSim Concepts

The basic concepts required to navigate and view an underlying GoldSim model within the Player are described in the topics listed below.

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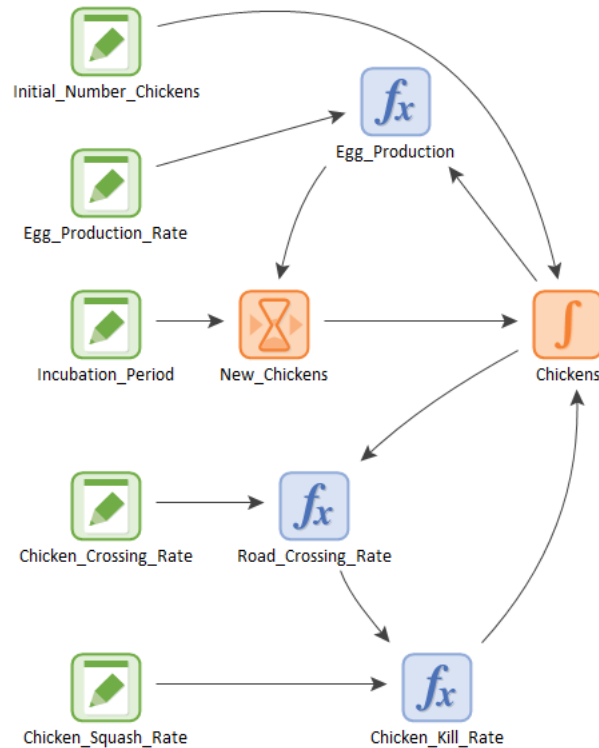
**Note:** If you are only interacting with a Player file through a dashboard, you do not need to be familiar with these concepts.

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Although the sections below will provide information sufficient for you to navigate your way through a GoldSim model in the Player, without knowing more about GoldSim, you will not be able to fully understand all of the objects and dialogs you see in a model. "*Learning More About GoldSim* on page 28" at the end of this document tells you how you can obtain further information about how GoldSim models work, and how they are built.

## GoldSim Elements

The GoldSim simulation environment is highly-graphical and completely *object-oriented*. That is, you create, document, and present models by creating and manipulating graphical objects representing data and relationships between the data.



In a sense, GoldSim is like a "visual spreadsheet" allowing you to *visually* create and manipulate data and equations. As can be seen in the simple example shown above, based on how the various objects in your model are related, GoldSim automatically indicates their influences and interdependencies by visually connecting them in an appropriate manner. GoldSim also sets up and solves the equations represented by the objects and their interdependencies.

The various objects with which a GoldSim model is constructed are referred to as *elements*. Each element represents a building block of the model, and has a particular symbol or graphical image (which you can subsequently customize) by which it is represented on the screen. Typically, each element will have a unique name by which it is referenced (e.g., X, Revenue, Rainfall, Discount\_Rate). Most elements accept inputs, and in turn produce outputs.

GoldSim provides a wide variety of elements. Some of these elements provide a mechanism for the user to enter input data into the model. Other elements represent functions which operate on one or more inputs and produce one or more outputs.

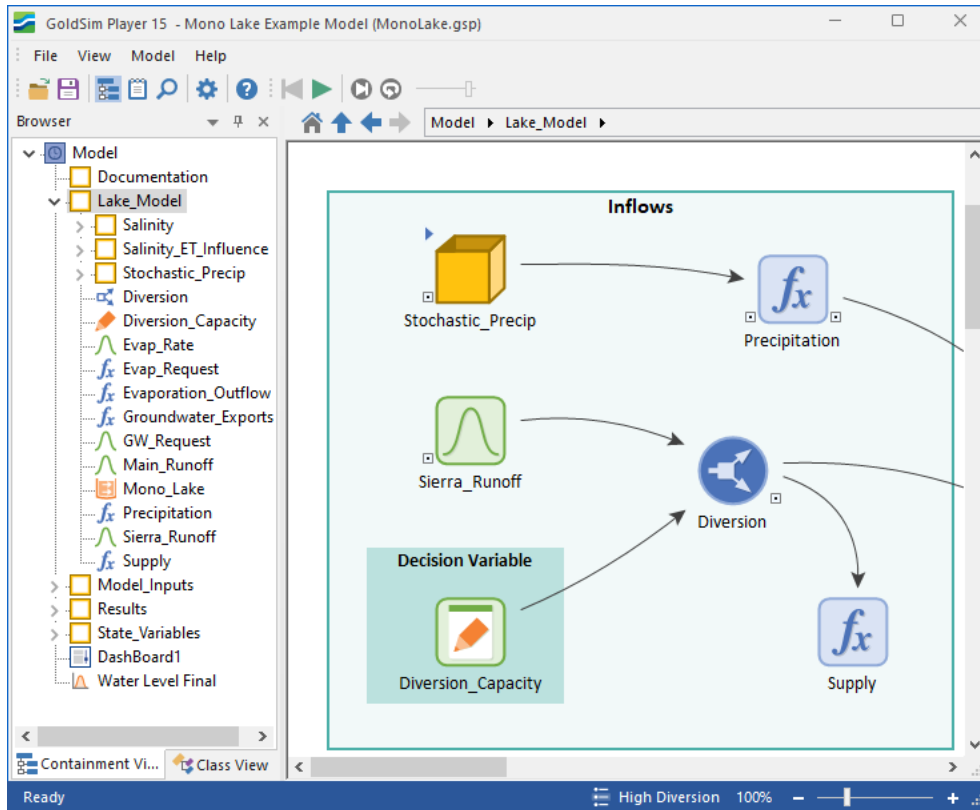
GoldSim models are built by connecting the outputs of one (or more) elements to the inputs of other elements. These connections are referred to as *links*:



A complex GoldSim model can have hundreds (or thousands) of elements and links.

## User Interface Components

When you are exploring a GoldSim model within the Player, the screen will look something like this:



The largest part of the screen is occupied by the **graphics pane**. This is where the graphical depiction of the model is shown. It is the "canvas" on which the model is drawn. You can zoom into and out of the graphics pane, and pan across it.

**Read More:** *Zooming and Panning in the Graphics Pane* on page 10

The **browser** will be present on the left-hand side of the screen. The browser represents an alternative way to view a GoldSim model. In particular, it organizes the model in one of two ways: 1) in a hierarchical manner (referred to as Containment View), similar to the way that files and directories on a computer are organized; or 2) by element type (referred to as Class View).

You can toggle the browser on and off by pressing the Browser button in the toolbar at the top of the screen:



### **Zooming and Panning in the Graphics Pane**

The graphics pane shows the contents of a single Container. You can move around within the graphics pane using the vertical and horizontal scroll bars and scroll arrows at the right and at the bottom of the pane.

**Read More:** *Understanding and Navigating Containers* on page 11

If your mouse has a wheel, you can also use this for panning around the graphics pane. After clicking anywhere in the graphics pane, the wheel moves upward and downward in the graphics pane. If you hold the **Shift** key the wheel moves the pane left and right.

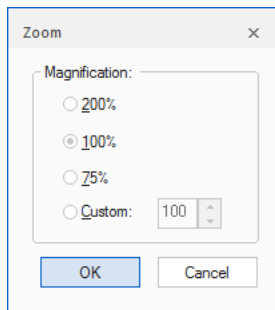
Note that if you scroll far enough horizontally or vertically you will eventually reach the "edge" of the graphics pane. That is, the graphics pane represents a document of fixed size.



In addition to panning around the graphics pane, you can change the scale at which the graphics pane is viewed (i.e., zoom in and zoom out). There are three ways to do this. The first two involve using controls in the lower right-hand corner of the status bar at the bottom of the window:



- Clicking the **Scale** button in the status bar (the number with the % sign next to it) displays a dialog for adjusting the scale.



- Moving the Zoom slider right or left zooms in and out. Pressing the "+" and "-" signs next to the slider zooms in and out in 10% increments.

If your mouse has a wheel, you can also use this for zooming. Rolling the wheel toward you while holding down the **Ctrl** key zooms out. Rolling the wheel away from you while holding down the **Ctrl** key zooms in.

## Understanding and Navigating Containers

A complex GoldSim model may consist of many hundreds or thousands of individual elements. In order to manage, organize and view such a model it is useful (in fact, essential) to group the elements into subsystems. A subsystem is simply a collection of elements.

Subsystems are created in GoldSim by placing elements into **Containers**. A Container is a "box" into which other elements have been placed. In a sense, it is somewhat like a directory folder on your computer. Containers can be placed inside other Containers, and any number of levels of containment can be created. This ability to organize model elements into a hierarchy allows GoldSim models to be constructed in a "top-down" manner, in which the level of detail increases as you "push down" into the containment hierarchy.

The graphics pane in GoldSim shows the elements inside a single container. When you explore a GoldSim model using the Player, you will typically start by viewing the inside of the Model Container (also referred to as the Model Root). This is analogous to the top-most directory on your computer.

Containers in a model are easily identified in the graphics pane: they all have a small triangle in their upper left-hand corner:



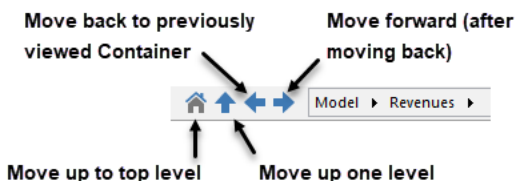
*Click the triangle to "enter" a Container.*

The default image for a Container in GoldSim is a box like the one shown above. The GoldSim author can, however, change this image to better reflect what the Container represents. Nevertheless, the small triangle in the

upper left-hand corner will always be present even if the Container's image has been changed. A Container is also identified as such by the tool-tip that is displayed when you hold your cursor over it in the graphics pane.

You can "enter" a particular Container (view its contents) by clicking on the triangle. You can also enter a Container via a Ctrl+double-click on the element (holding the **Ctrl** key down while double-clicking the left mouse button).

You can move through the containment hierarchy using the navigation bar at the top of the graphics pane:



While the various images in the graphics pane can be customized by the model author, the small icons in the browser cannot be changed. Hence, Containers in the browser are always indicated by a small box (although some may be open and some may be closed). Expanding the Container in the browser (clicking on the ">") shows all of its contents (all of the elements it contains).

Note that the browser and the graphics pane are synchronized. Hence, if you click on an element in the browser, the Container in which the element resides will be shown in the graphics pane. This provides a convenient way to navigate through the subsystems in a model.

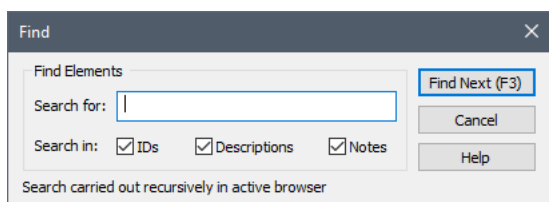
## Searching for Specific Elements

To assist in finding specific elements in a model, GoldSim provides a Search utility.

To start a search, press the Search button in the toolbar:



When you do so, the following dialog will be displayed:



Enter a string and press the **Find Next** button (or press **F3**) to find the next item in the browser that matches the search string. This will close the dialog and carry out the search. Once you have moved through the browser tree to more than one item, you can press **Shift-F3** to jump to back to a *previous* item (as opposed to the *next* item).

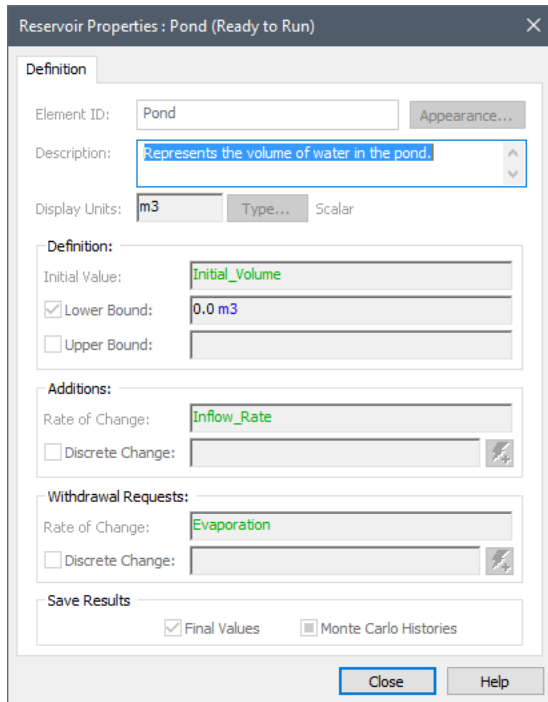
The search is not case-sensitive.

You can control where GoldSim searches selecting whether you want to search in IDs, Descriptions, and/or Notes.

**Read More:** *Viewing Element Notes* on page 13

## Viewing Element Properties

You can display the properties of any element in a model by double-clicking on the element. This will display a properties dialog:



Each element has a different dialog. The dialog will be grayed out (since you cannot edit it).

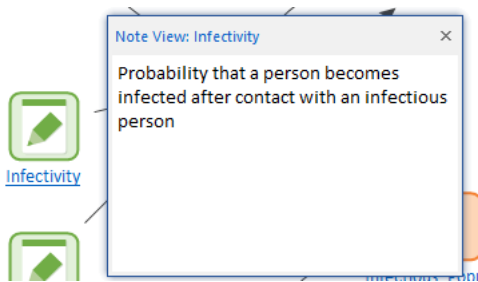
The input fields to an element can contain either:

- a value (e.g., 0 m3);
- a link to another element (e.g., Inflow\_Rate); or
- a mathematical expression (which itself can incorporate links from other elements (e.g., 3\*Inflow\_Rate)).

Most elements will have specified *display units*, which control how the units in which the elements outputs will be displayed (some outputs may be dimensionless, and hence will have no units).

## Viewing Element Notes

The GoldSim author may have associated a Note with one or more of the elements in the model. If an element has a Note attached to it, the name of the element will be underlined. You can view the Note by clicking on the element name. When you do so, the Note Pane will be displayed at the bottom of the screen. The Note Pane will initially be docked, but you can grab it (by the title bar) and float it anywhere on the screen:



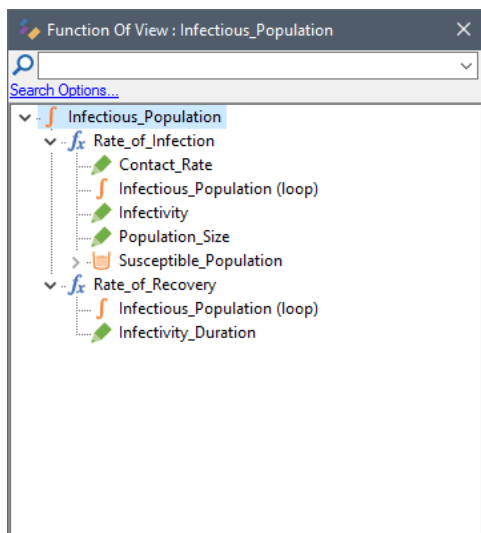
You can also toggle the Note Pane on and off by pressing the Note button in the toolbar:



If the Note Pane is open, it will display the Note associated with whatever element is selected in the graphics pane. If no element is selected when the Note Pane is on, it will be empty.

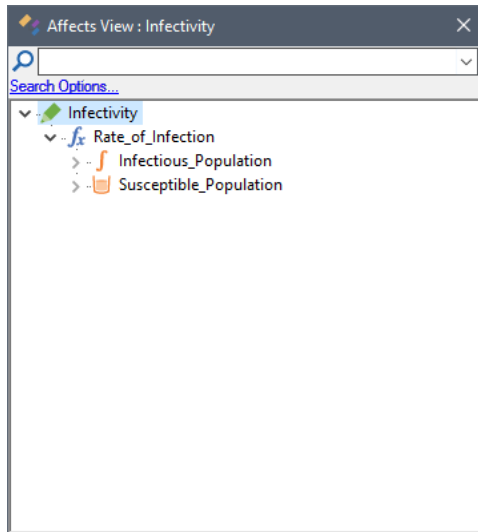
## Viewing Element Dependencies

In complex models, it is often useful to explore the interdependencies of the various elements (i.e., who affects who). GoldSim provides two very powerful utilities for doing this: the **Function Of View**, and the **Affects View**. If you right-click on an element in either the graphics pane or the browser (to access the context menu) and select **Function Of...**, a floating window is displayed:



This is a specialized browser view of the model. It starts with the selected element, and only shows those elements which affect that element (i.e., those elements which the selected element is a *function of*). In the above example, Infectious\_Population is a direct function of two elements: Rate\_of\_Infection and Rate\_of\_Recovery. These, in turn, are direct functions of other elements.

Similarly, if you select **Affects...** from the context menu, a window like this will be displayed:



This view of the model starts with the selected element, and only shows those elements which are a function of that element (i.e., those elements which the selected element *affects*).

In the above example, Infectivity directly affects Rate\_of\_Infection, which directly affects Infectious\_Population and Susceptible\_Population.

These two browser views have all the functionality of the regular browser (e.g., tool-tips, context menus). If you double-click on an element in one of these views, its property dialog is displayed.

In addition, the context menu for an item in the Function Of or Affects browser includes an option to immediately jump to the opposite view. That is, if you are viewing a Function Of list, you can right click on any element in the list, and immediately jump to the Affects list for the selected element.

By default, Function Of and Affects browser views are synchronized with the regular browser (and hence the graphics pane). As a result, as you explore the interdependencies of the elements, you can simultaneously observe where they are located in the containment hierarchy.

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**Note:** If desired, you can turn off the synchronization by right-clicking on white space in the Function Of or Affects view (i.e., not on an element), and clearing the Synchronize option in the context menu.

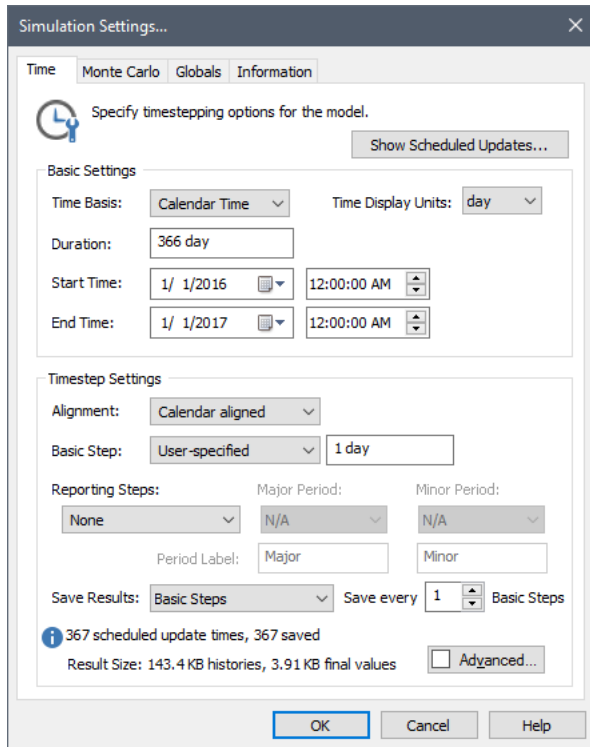
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The Function Of and Affects have a search field, and this can be very useful for answering questions like "Is Y a function of X?" or "Is Y affected by X?".

**Read More:** *Searching for Specific Elements* on page 12

## Viewing the Simulation Settings

If you select the **Model | Simulation Settings...** from the main menu, you can view the various settings that are used when the model is run:



The **Time** tab of the dialog indicates the duration of the simulation, the number of timesteps (and hence the timestep length), and the units in which time are displayed in results.

The **Monte Carlo** tab of the dialog specifies the Monte Carlo options (how probabilistic simulations are carried out), such as the number of realizations, and whether Latin Hypercube sampling is to be used.

The **Globals** tab of the dialog lists any global variables that may be defined for the model.

The **Information** tab of the dialog provides information such as the model author, any description that the author may have provided, and some statistics about the model (e.g., number of elements).

Depending on how the Author of the Player file has set up the file, you may or may not be able to edit the Simulation Settings.

## Viewing the Run Log

Once a model has been run, the **Run Log** can be viewed by selecting **Model | View Run Log...** from the main menu. The Run Log contains basic information regarding the simulation (e.g., the version of the program, the date, the simulation length), and any warning or error messages that were generated.

## Viewing Results When Exploring the Model

After a simulation is complete, the Player file will be placed in Result Mode, indicating that it contains results that can be viewed. In some cases, Player files will be in Result Mode when you first open them.

This will be indicated by the status bar ("Results" will be displayed on the left side of the status bar and the status bar will be green):



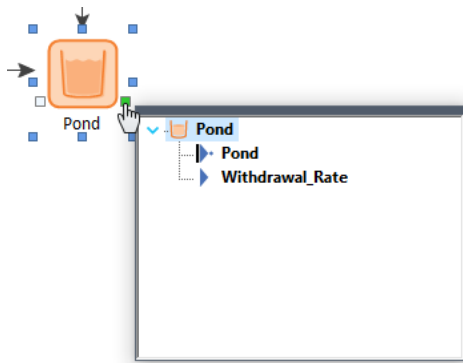
In order to view results, you must access the outputs of an element. Some elements have a single output. Other elements have multiple outputs. If an element has multiple outputs, one of the outputs may be defined as the **primary output** for the element. Primary outputs have the same name as the element itself.

The outputs for an element can be viewed in the graphics pane by using the element's **output port**. The output port for an element appears as a small box on the lower right-hand side of the element:

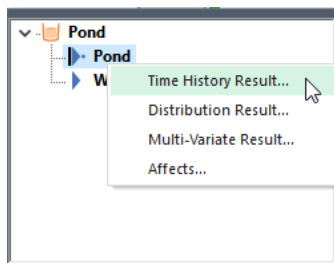


When in Result Mode, elements which have saved results will be identified in two ways: 1) the elements (and their outputs) will be **bold** in the browser; and 2) the element output ports in the graphics pane will be green.

Placing the cursor over the output port changes the appearance of the cursor to a pointing hand. If you left-click on the port with this cursor, a browser view (referred to as an output interface) is displayed:



Right-clicking on a specific output will provide a context menu for displaying results:



Depending on the type of simulation, the context menu will display choices for viewing different types of results.

Clicking on one of these items in this menu displays the results for the selected output, either in the form of a chart or a table (depending on user-defined default settings).

This manner of viewing results in GoldSim is so fundamental to the GoldSim design that it bears repeating: **To view the result of an element, right-click on the element (or one of its outputs) and select the appropriate result type at the top of the menu.**

## Running Player Files

The author of a Player file can specify whether or not you can run the model in the Player. In general, however, if your Player file has a Dashboard, it was probably designed so that you will be able to run it. If it does not have a

Dashboard, it was probably designed so that you will not be able to run it (since you would not be able to change any of the inputs).

The following sections describe how you can run a Player file, and if it has a Dashboard, how you can view results in the Player.

## Running, Pausing and Stepping Through a Simulation

If your Player file can be run, the Run Control toolbar will be active (i.e., it will not be grayed out) when you open the model:

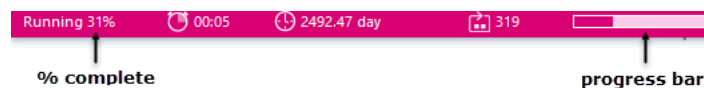


The Run Control toolbar allows you to run, monitor, pause and step through the simulation in a controlled manner.

Pressing the **Run** button on the Run Control toolbar (second button from the left) starts a simulation:



Prior to running, the status bar (at the bottom of the window) is blue. Once the simulation is started, the status bar changes color (to pink) and "Running" is displayed on the left side of the bar:



Next to "Running", an estimate of the progress of the simulation (in terms of what fraction is currently complete) is displayed. The progress is displayed both as a percentage, and as a progress bar (on the right side of the status bar).

While the model is running, several buttons in the Run Control toolbar change: **Run** (the second button from the left) changes to **Pause**, and **Reset** (the first button from the left) changes to **Stop**:



*Run Control toolbar prior to running model. First button from left is **Reset**. Second button from left is **Run**.*



*Run Control toolbar while running model. First button from left is **Stop**. Second button from left is **Pause**.*

The **Pause** button pauses the simulation. While a model is paused, you can view results, navigate through the model (if it is browsable), and modify inputs using the input controls. When a model is paused, the second button from the left changes back to **Run**:



*Run Control toolbar while model is paused. First button from left is **Stop**. Second button from left is **Run (resume)**.*

When a model is paused, pressing the **Run** button resumes (restarts) the simulation from the point at which it was paused.

Pressing the **Stop** button at any time while a model is running (or paused), immediately aborts the simulation. If some Monte Carlo realizations have been completed when you abort, you will be prompted for whether you wish to save the results of the completed realizations, or discard them. If you choose to save the results, the completed realizations will be available for viewing.




The slider on the right-side of the Run Control toolbar can be used to artificially slow down a simulation. This is useful, for example, when viewing simple animations in a Dashboard in a model that otherwise would run very quickly.


---

**Warning:** By default, the slider is all the way to the right (Fast). If you want the simulation to run as quickly as possible, make sure that the slider stays in this position. If you move it to the left, the simulation will take longer!

---

The two buttons to the immediate left of the speed control slider allow you to step through a simulation one timestep or one realization at a time:

: Simulate one timestep

: Simulate one realization

If you press the button for simulating one timestep, the Player will complete the next timestep and then pause. If you press the button for simulating one realization, the Player will complete the next realization and then pause.

A small dialog will alert you when the simulation is complete. Click the OK button in this dialog (the only button) to view the results. After a simulation is complete, the model will be placed in Result Mode. The status bar turns green and "Results" is displayed on the left side:



After a simulation is complete, and the model contains results, the Player will not allow you to change any of the inputs via the input controls. In order to change inputs, you must first reset the model by pressing the **Reset** button (first button from the left):



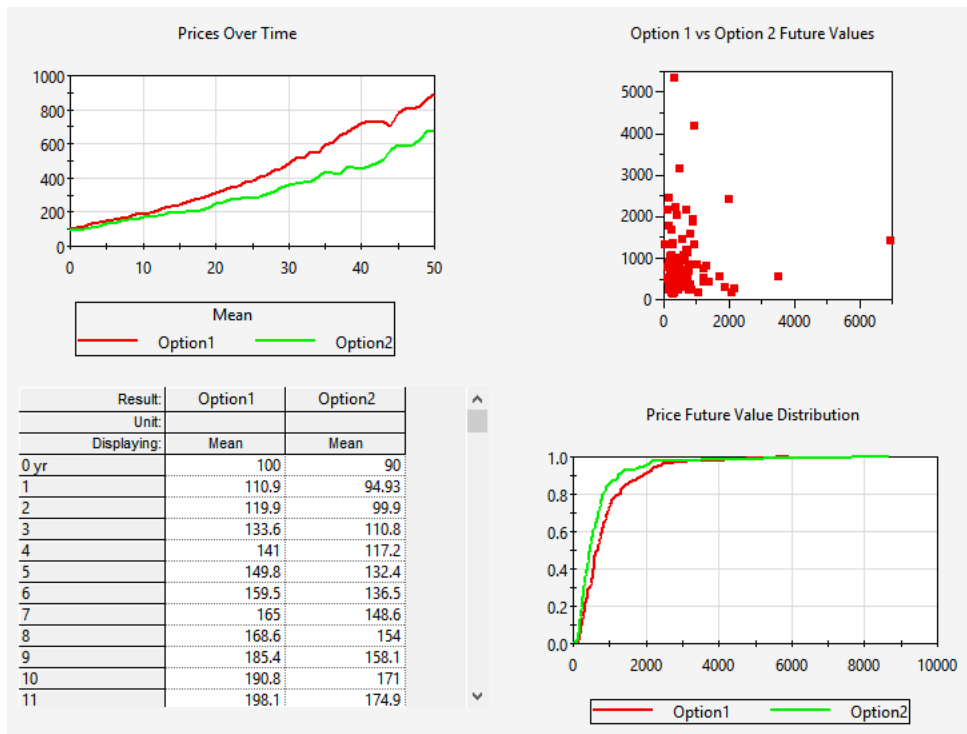
*Run Control toolbar after model has been run and has results. First button from left is **Reset**. The Dashboard Author may optionally create buttons that are placed on the Dashboard for running and resetting a model.*

You can also reset the model by pressing **F4**. This clears all of the results and allows you to change input controls and start a new simulation. Pressing any of the other buttons in the Run Control toolbar also resets the model (and starts a new simulation).

## Viewing Results in a Dashboard

There are numerous ways to view results in a Dashboard. In some cases, results will simply be displayed as values. In others, they will be displayed graphically (e.g., in terms of a thermometer).

More frequently, the Dashboard will display a chart (or table) of results directly:



Moreover, if the author allows it, double-clicking on a Result Window in a Dashboard "pops-out" a larger and more detailed version of the chart or table:



In some cases, rather than embedding charts and tables directly (as above), buttons might be used to provide access to result charts or tables.

## Running Scenarios in the Player

Some Dashboard files may include a control that looks like this:



In this case, the model has been created to run scenarios. GoldSim provides a specialized capability that allows you to create, run and compare different scenarios for your model. Scenarios are differentiated by having different sets of input data. GoldSim's scenario modeling capability allows you to directly compare results generated by your model by different sets of input parameters. In effect, when you use this capability, your model can store (and subsequently compare) multiple sets of inputs and outputs.

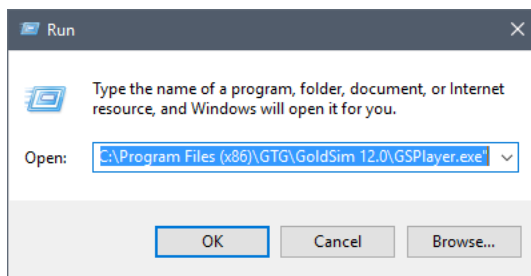
When viewing a model that uses a scenario control, you should note the following:

- The drop-list contains all the scenarios in the model.
- When you change any of the inputs on the Dashboard, they are saved with the selected scenario.
- Pressing the Run button on the scenario control runs the selected scenario.
- Pressing the Run All button on the scenario control runs all the scenarios.
- If the author allows it, there will be buttons that allow you to add and delete scenarios..
- If the author allows it, there will be a button that allows you to compare the inputs for all defined scenarios.
- If a scenario has results, an asterisk will appear next to it in the list. Time History and Distribution charts and tables display results for all scenarios that have results. Other controls (such as thermometers) show results for the selected scenario.
- Pressing the Reset button on the Run Control toolbar allows you to delete results for the selected scenario (or all scenarios).

## Running the Player from the Command Line

In some cases, it may be useful to run the GoldSim Player directly from the command line.

This, for example, could be done by selecting **Run** from the Windows **Start** menu, which displays the following dialog:



You must enter the full path to the GoldSim Player executable (which may, of course, be different than that shown above), followed by the GoldSim Player file that you want to open. If no filename is specified, GoldSim opens a new file.

**Note:** If no path is specified for a filename, GoldSim looks in the last directory from which a GoldSim file was opened. Hence, it is highly recommended that you provide a full path for the filename.

---

The primary reason for running the Player from the command line is to take advantage of a number of command line parameters that cause the Player to execute in a specific manner.

The command line parameters are summarized in the following table. Note that the parameters are entered *after* the executable and *before* the model file name.

Parameter	Description	Comments
-r -run	Opens the GoldSim Player file and immediately runs the simulation.	
-getdb [date]	Executes a global database download for all elements linked to databases.	The date is only required for Extended GoldSim databases. The date must be specified in local format and be enclosed in quotes (e.g., "7 March 2013").
-x	Closes GoldSim after all other options have been executed.	Note that unless the -sv parameter is also used, the GoldSim Player file will NOT be saved when the application is closed.
-sv [filename] -save [filename]	Saves the Player file using either the optionally provided output filename, or the input filename (if an output file is not provided).	This option can be used to run and save a Player file.
-starttime "date[time]"	Resets the Start Time	The time is optional. The date/time string can take on any of the following formats: "25 January 1996" "January 25, 1996 8:30:00" "8:30:00 Jan. 25, 1996" "1/25/1996 8:30:00" Time can be specified in military (24 hour time) or 12 hour time using PM and AM.

Parameter	Description	Comments
-endtime "date[time]"	Resets the End Time	-endtime and -duration are mutually exclusive (only one can be set). The -endtime flag must be used in conjunction with the -starttime flag. The time is optional. The date/time string can take on any of the following formats: "25 January 1996" "January 25, 1996 8:30:00" "8:30:00 Jan. 25, 1996" "1/25/1996 8:30:00" Time can be specified in military (24 hour time) or 12 hour time using PM and AM.
-duration "time expression"	Resets the Duration using the provided expression	-endtime and -duration are mutually exclusive (only one can be set). Time expression should use GoldSim's built-in units, and must have dimensions of Time.

Examples of how these parameters would commonly be used are provided below. Note that these parameter strings would follow the name (and path) of the GoldSim Player executable (GSPlayer.exe).

Command line	Comments
-r test1.gsp	Opens test1.gsp, executes pre-run checks and starts the simulation. GoldSim Player remains open after the simulation.
-r -sv test1.gsp	Opens test1.gsp, executes pre-run checks and starts the simulation. At the end of the simulation, the Player file is saved. GoldSim Player remains open after the simulation.
-r -sv -x test1.gsp	Opens test1.gsp, executes pre-run checks and starts the simulation. At the end of the simulation, the Player file is saved. GoldSim Player is then closed.
-r -sv test1res.gsp test1.gsp	Opens test1.gsp, executes pre-run checks and starts the simulation. At the end of the simulation, the Player file is saved to test1res.gsp. GoldSim Player remains open after the simulation.

Several points should be noted regarding the use of the -starttime, -endtime and -duration commands:

- In order for these to work, the Player file must have been created by the author such that "Allow changes to model's Simulation Time Settings" was checked.
- The arguments to these commands must be enclosed in quotes.
- Units must be specified if the input has dimensions.

- The commands can only be used in the following combinations:
  - -starttime only (Elapsed Time, Calendar Time or Static models)
  - -starttime and -duration (Elapsed Time or Calendar Time models)
  - -starttime and -endtime (Calendar Time models only)
  - -duration only (Elapsed Time or Calendar Time models)

Examples of the use of the -starttime, -endtime and -duration commands are provided below:

Command line	Comments
-starttime "1/1/2021"	Sets the Start Time to 1 January 2021
-starttime "25 January 2021 18:30:00"	Sets the Start Time to 25 January 2021 at 6:30 PM
-starttime "25 January 2021 6:30:00 PM"	Sets the Start Time to 25 January 2021 at 6:30 PM
-starttime "1/1/2021" -duration "100 days"	Sets the Start Time to 1 January 2021 and the Duration to 100 days
-starttime "1/1/2021" -endtime "1/1/2022"	Sets the Start Time to 1 January 2021 and the End Time to 1 January 2022
-duration "100 days"	Set the Duration to 100 days (using the defined Start Time and replacing the End Time)

In most cases, it is likely that you will want to "stack" a number of GoldSim runs by creating a batch file that you run from the command line. However, if you simply stack command lines and then run a batch file, all GoldSim Player calls would be launched in parallel (e.g., if you had 10 command lines that ran GoldSim Player, 10 instances of GoldSim Player would open and run simultaneously).

To avoid this problem and force the commands to run in series, you can use the Start/Wait command provided by Windows. An example batch file that utilizes this is shown below:

```

CD c:\Program Files\GTG\GoldSim 14.0
Start /wait GSPlayer.exe -r -sv -x c:\runs\input1.gsp
Start /wait GSPlayer.exe -r -sv -x c:\runs\input2.gsp
Start /wait GSPlayer.exe -r -sv -x c:\runs\input3.gsp
Start /wait GSPlayer.exe -r -sv -x c:\runs\input4.gsp
    
```

The first line simply sets the directory to the location of the GoldSim executable. The next line opens a GoldSim Player file called input1.gsp. The Player runs the model, saves the results and then closes. After closing, the next GoldSim Player command is implemented (open input2.gsp, run and save the model). This continues until all four GoldSim runs are complete.

### ***Running the GoldSim Player in Hidden Mode Using the Command Line***

The GoldSim Player provides a command line option that runs the Player in "hidden mode", such that it runs as a background process, and is not actively seen on the desktop. This is useful in cases where you want a separate program to run the Player (without the user being aware that it being run).

This is accomplished using a -h (for "hide") flag. The flag can be used in combination with any existing command line flags (such as -r for run, -x for exit, -getdb to run a database import). Note, however, that if the hide flag is specified, the Player will automatically exit after execution. In other words, it is not necessary to include the -x flag if the hide flag is used. An example command line instruction with the -h flag is given below:

```
GSPlayer.exe -h -r -sv Model1_Results.gsp Model1.gsp
```

This would open the model file "Model1.gsp", run it, save it to "Model1\_Result.gsp", and exit, all in the background (i.e., such that the fact that the Player ran will not be apparent to the user).

In hidden mode, error messages and Interrupt Element messages are suppressed (i.e. not shown). However, an alternative command line flag, -hl (or -hide-log), is available that instructs the Player to generate a log file to which any such messages will be written. If the run is executed successfully, the log file will contain the text 'SUCCESS!'. Otherwise, it will contain the text 'ERROR!' followed by details of the error. The log file name, by default, is the name of the Player file with the .gsp extension replaced by a .log extension. Alternatively, a log file name may be provided (inside double quotation marks if it includes spaces) following the -hl (or -hide-log) flag. An example is shown below.

```
GSPlayer.exe -hide-log "Model1 Errors.log" -r Model1.gsp
```

The following points should also be noted:

- If the Player file has Time History elements exporting results to Excel or to a Text file, the results are only automatically exported if the model option "Export results after simulation" was previously selected.
- If the -getdb flag is specified with a "date" that is invalid, an error message "Effective date for database download is invalid!" is logged (assuming the -hl or -hide-log flag is used) and the process terminates with error code 1.
- An Interrupt element error message will only be written to a log file if the Interrupt element causes an abort operation.
- If a log file with a specified name already exists, it will be overwritten (i.e. GoldSim Player will not append to an existing file), unless the file is read-only. If the file is read-only, GoldSim Player skips writing a log file.

Note that the Player process returns an exit code upon exiting when running in hidden mode. A 0 code indicates no errors were identified. A code of 1 or greater indicates an error.

Exit Code	Comments
0	Successful execution.
1	An error occurred while preparing or running the simulation. This includes any errors while checking the model, importing data from external sources, running the model.
2	GoldSim Player was unable to create, open or write to the log file. Program execution may or may not have been successful.
4	File I/O Error: GoldSim Player was unable to load the model file.
5	Generic Error Processing Shell Command: this is a fall back for cases when an error occurred but cannot be traced back to the a specific origin.
9	An error occurred during post-simulation export of model results.

Exit Code	Comments
10	GoldSim Player was unable to obtain write access to spreadsheet file required for saving intermediate model output data.

The exit code can be queried using an IF statement in the batch file as shown in the example below:

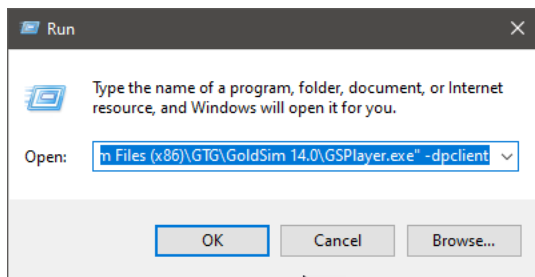
```
if errorlevel 1 ( echo ERROR while executing GoldSim [code:%errorlevel%])
```

In this example, if the error code is 1 or greater, the error code will be written to the console.

## Using the GoldSim Player as a Client

The Distributed Processing Module uses multiple copies of GoldSim running on multiple machines to share the computational burden of a Monte Carlo simulation. The GoldSim Player can be used as a Client (of a Controller process) in such a simulation. This allows computers that do not have registered copies of GoldSim to still be used as a Client.

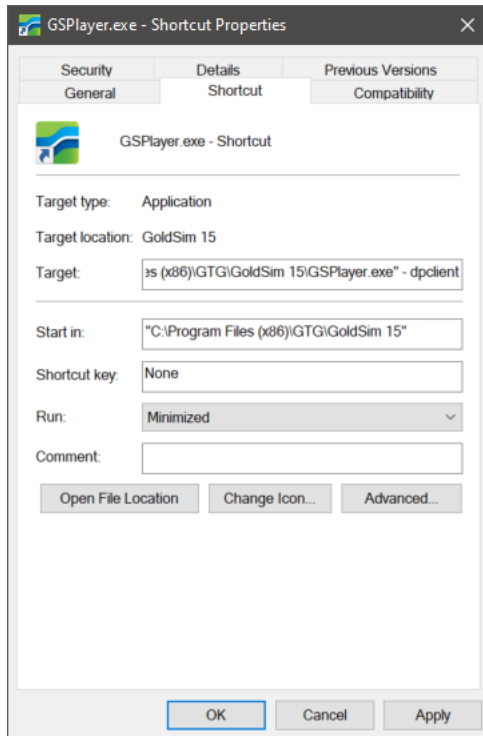
To launch the GoldSim Player in Client mode, you must run the Player from the command line using the "-dpclient" parameter. Typically, this would be done by selecting **Run** from the Windows **Start** menu, which displays the following dialog:



You must enter the full path to the GoldSim Player executable (which may, of course, be different than that shown above), followed by the "-dpclient" command line parameter.

You could accomplish the same thing by creating and running a shortcut to the GoldSim Player executable with the appropriate command line parameter:

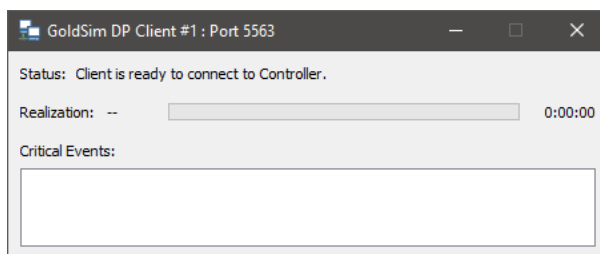




*In this particular case, the Player would be launched in Client mode and immediately minimized.*

If you placed this shortcut in the StartUp directory of the machine, the GoldSim Player would be loaded in Client mode whenever the machine was booted. A Client requires approximately 6Mb of memory when it is loaded prior to being accessed by a Controller process. Hence, the act of loading the Client will not significantly impact anyone who is using that particular machine. Moreover, once a Controller accesses the Client (and begins to send it realizations to process), the priority of the Client is lower than that of other processes running on the machine. As a result, although an active Client will slow the system down somewhat, the machine can still be used for other applications, with the GoldSim Client running in the background.

If you launch a Client which is not yet connected to a Controller, the following dialog will be displayed:



Pressing the **X** in the upper right-hand corner will terminate the Client process (close the GoldSim Client executable) so that it can no longer be accessed by a Controller. A Client can also be terminated remotely by the Controller.

It is not necessary that a GoldSim model file be present on the Client machine. When a simulation is started, the Controller transfers all necessary files to the Client.

---

**Note :** It is possible to run multiple Clients on a single multi-processor computer (one for each processor).

---

## Learning More About GoldSim

All Player files are built using the GoldSim simulation software. If you are interested in understanding all of the details of a model that you are viewing in the Player, you will need to learn more about GoldSim.

You can do so by visiting the [GoldSim website](http://www.goldsim.com) (www.goldsim.com). The website provides further information on GoldSim (e.g., a "Quick Tour" and a variety of case studies). You can also request a free evaluation copy of GoldSim from the website. In addition to downloading the evaluation version, you can download the GoldSim User's Guide. Finally, the website provides information on how you can license the software so you can build your own GoldSim models.

If you need any further information, contact us at [software@goldsim.com](mailto:software@goldsim.com).

## Technical Support

If you are having trouble using a Player file, you should first contact the Player file author (if they can be identified), to ensure that the problem is not with the file rather than the Player. The name of the Author of the Player file can be viewed by clicking **File|Model Info...** from the main menu.

Users with active Software Maintenance can submit questions directly to the GoldSim support team. Evaluation users are also welcome to contact us with questions on GoldSim functionality. The **GoldSim Help Center** (<https://goldsim.zendesk.com>) is the primary portal for technical support. You can submit your questions directly from the Help Center. If you register and log in through the Help Center, you will be able check the status and view a history of all of your support requests.

---

# Glossary

## A

---

### **Affects View**

A special browser view in GoldSim that allows you to see all the elements the selected element affects.

## B

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### **Browser**

An alternative view of a GoldSim model, in which elements are displayed in a tree, and organized either hierarchically, or by type.

## C

---

### **Client**

A GoldSim executable that acts as a client that shares the computational burden when using the Distributed Processing Module.

### **Containers**

Objects within a GoldSim model that are analogous to folders, and are used to organize the model in a hierarchical manner.

## D

---

### **Dashboards**

Specialized user interfaces that can be built into a Player file. Dashboards look like "control panels", with buttons, sliders and display panels, and provide a mechanism by which inputs to a model can be modified within the Player.

### **Display Units**

The units (e.g., m, g, \$/day, kg/hr) in which an output is displayed within GoldSim.

### **Distributed Processing Module**

A specialized GoldSim module that allows you to use multiple computers connected over a network to share the computational burden of a Monte Carlo simulation.

## E

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### **Elements**

Objects that represent basic building blocks of a GoldSim model.

## F

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### **Function Of View**

A special browser view in GoldSim that allows you to see all the elements that affect the selected element.

---

## **G**

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### **Graphics Pane**

The primary portion of the GoldSim interface, where the graphical depiction of the model is shown.

## **L**

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### **Links**

Connections between two elements created by making the output of one element the input to another.

## **O**

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### **Output Port**

A small box on the side of the element in the graphics pane. You can left-click on the output port to access the element's outputs.

## **P**

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### **Primary Output**

For an element with multiple outputs, the output that has the same name as the element.

## **R**

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### **Realization**

A single model run within a Monte Carlo simulation. It represents one possible path the system could follow through time.

### **Run Log**

Text that is stored with a GoldSim model that is in Result Mode. It contains basic information regarding the simulation, and any warning or error messages that were generated.

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