

# GoldSim 15 Summary

## *Summary of New Features and Changes*

January 2025



**GoldSim**

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# Introduction

This document describes the primary changes and new features implemented in GoldSim 15. A full listing of all the changes can be found in the Release Notes (accessible under Help in the main menu).

## Documentation of New Features

This document summarizes the major changes in GoldSim 15. All new features discussed in this document are described in detail in the accompanying Help system and user manuals for this release. In the sections below, links are provided to those parts of the web-based Help system describing the new features.

## Installation Instructions for this Version

You do not need to uninstall other GoldSim versions (such as GoldSim 14.0) to install GoldSim 15. The new version will be installed in parallel to any existing pre- GoldSim versions currently on your machine (it will not overwrite them).

To install GoldSim 15, you must download the full installation file: “GoldSim\_15\_Setup.exe”. Download the file from the website and run it. Note that you must have administrative privileges to install GoldSim successfully.

To use GoldSim 15, you will need to enter a new Activation Code. All users with active maintenance should have received a new Activation Code.

If you have any questions, please contact us at the [GoldSim Help Center](#).

# Major New Features

## Performance Improvements

GoldSim 15 contains a significant number of performance improvements that will likely make your model run faster. The improvements are the result of architectural changes (e.g., to support new features of modern CPUs), code optimizations, new predictive branching algorithms during simulation execution, and enhanced caching.

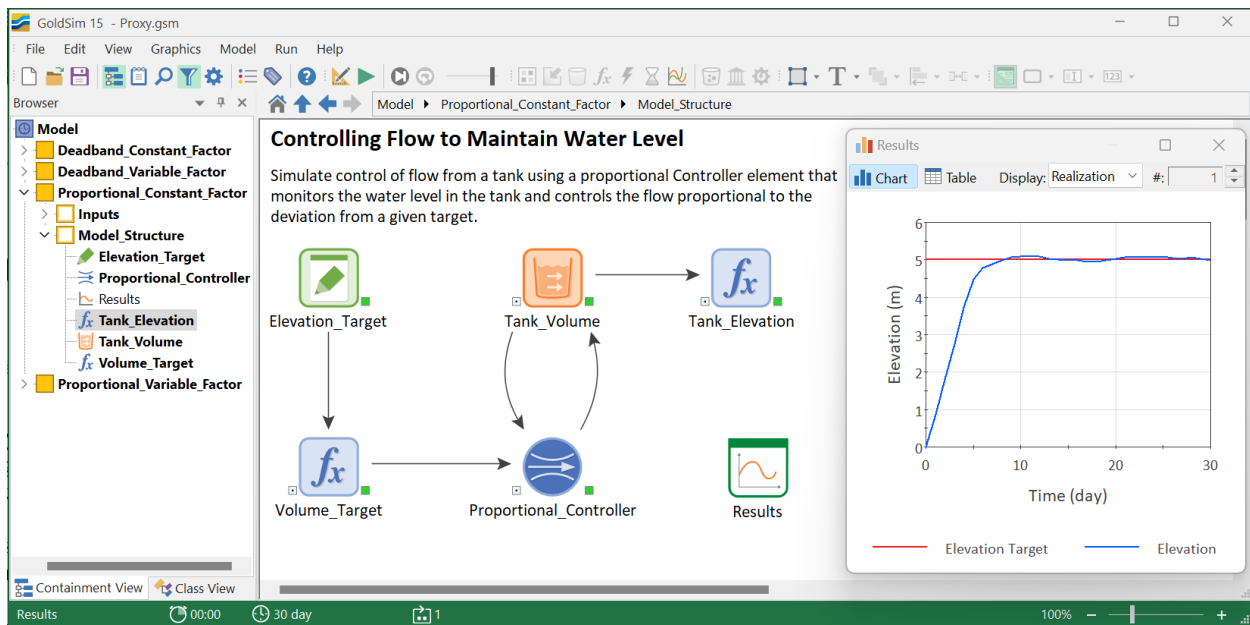
The impact of these performance improvements will vary widely as all improvements and optimizations depend on model configuration, simulation settings, the nature of the data, and the computer you are using (CPU, memory, storage speed). However, in our testing we experienced simulation performance in most medium to large models improve by between

50% to 200%. Memory use in GoldSim 15 is also typically reduced by 5% to 15% (although in rare cases, it could increase slightly).

Note, however, that a side-effect of these faster capabilities is that floating-point operations may round a result differently. Therefore, results may be slightly (but insignificantly) different than in previous versions of GoldSim.

## New Element: The Controller

GoldSim 15 introduces a powerful new element: the Controller. Controller elements allow you to more easily simulate **feedback control systems**. The goal of a feedback control system is to control the value of a state variable (e.g., volume in a pond, heat in a house) or a proxy for that variable (e.g., water level in a pond, temperature in a house) by actively adjusting additions (inflows) or withdrawals (outflows) with the goal of smoothly approaching and/or dynamically maintaining a desired target value.

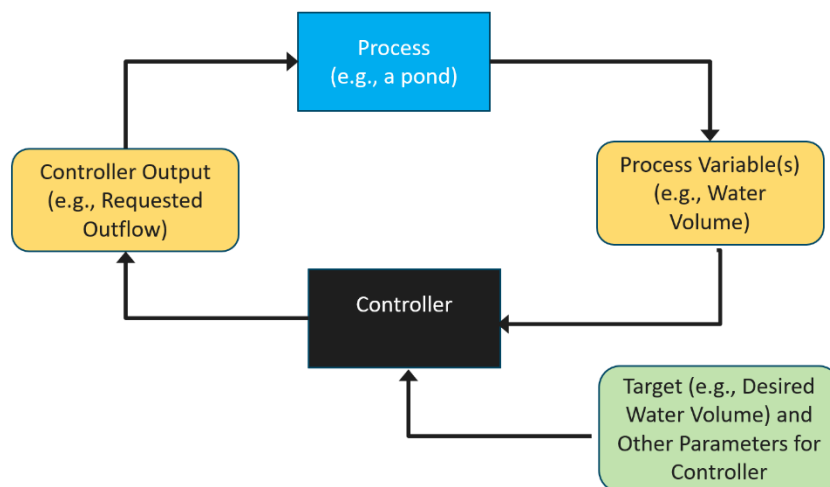


While control systems can be represented in GoldSim using basic GoldSim elements, the Controller element makes it much easier to build and represent such systems while also enforcing a consistent methodology and removing difficulties users can face when building the logic from scratch with basic elements.

Controllers use feedback control to influence the state of a “process” and adjust it to a desired value (a **target**). A “process” could conceptually involve something quite complex (e.g., an entire chemical plant), but typically it will be something much more specific (e.g., a single tank in that plant). The state is some property of the process that we want to control (e.g., the volume of water in the tank). The state is referred to as the **process**

**variable.** In GoldSim, the process variable is usually the main output of a Pool or Reservoir (and hence a state variable), but this is not required (e.g., it could be some function of one or more state variables).

Controllers produce a single output which is always a flow of some kind (e.g., an inflow or outflow of water, heat, mass, items, etc.). This flow is then intended to be connected back to the process (e.g., a Pool element representing the volume of water in a tank) in order to adjust the value toward the target. The key point is that the Controller requires as input a process variable (which will be either the primary output of a Pool or Reservoir or some function of such outputs) and in turn produces a flow that is then directed back to impact that process variable (e.g., an inflow or an outflow to the Pool or Reservoir defining the process variable). This forms a feedback loop:



The goal of the Controller is to produce an output that when fed back into the process directs the process variable back toward the target.

The Controller has three different (user-selected) control methods by which it determines the Controller output (Deadband, Proportional and PID).

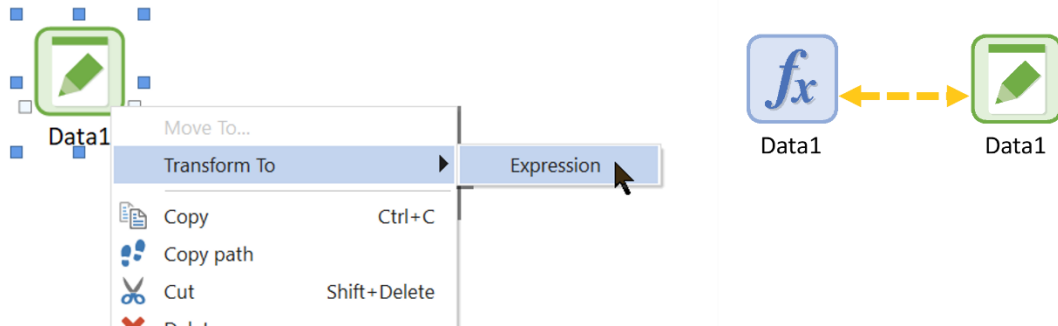
You can read more about the new Controller element [here](#).

## Other Notable Changes

- You can now open the properties dialog of an element by selecting it and pressing **Alt-Enter**. If multiple elements are selected, one of the objects will be the “anchor object” and will have blue selection handles (it represents the last object selected). Pressing **Alt-Enter** when multiple objects are selected opens the properties dialog

for the “anchor object”. Pressing **Alt-Enter** with no objects selected opens the properties dialog for the Container. This feature was implemented in GoldSim 14 R1 but has not previously been documented.

- Although you have always been able to enter expressions (with links) into the Data Definition field for a Data element and enter constants into the Equation field for an Expression, it is strongly recommended that you only enter values for Data elements and mathematical expression into Expression elements. Doing so helps to make your models more transparent, since the Data symbol will visually indicate to anyone viewing the model that the element represents a constant, and the Expression symbol will visually indicate that the element represents a mathematical expression. In GoldSim 15, if have entered an expression into a Data element, you can easily convert the element to an Expression element by right-clicking on it, and selecting **Transform to Expression**. Similarly, if have entered a constant value into an Expression element, you can easily convert the element to a Data element by right-clicking on it, and selecting **Transform to Data**.



- The toolbars (and to a lesser extent, the main menu) were redesigned and simplified. This is most evident for the Dashboard Tools and Graphical Tools toolbars. Some rarely used toolbar buttons were eliminated.
- Shortcut keys for inserting a number of commonly used elements were added. These are all used by holding the **Ctrl** key down while selecting a number:

Shortcut Ctrl [Number]	Element Inserted
0	Stochastic
1	Container
2	Data
3	Expression
4	Lookup Table
5	Time Series
6	Integrator

Shortcut Ctrl [Number]	Element Inserted
7	Sum
8	Pool
9	Time History Result

- When running scenarios, in addition to running a single scenario or all scenarios, you can now also choose to run a selected subset of scenarios. You can read more about this [here](#).
- Several key combinations have been added to make it easier to add and move scenarios in the Scenario Manager when you have a large number of scenarios. You can read more about this [here](#).
- The versioning feature has been updated and improved. In particular, there are two notable changes:
  - Whenever you create a new version, GoldSim will immediately ask you if you want to archive a backup copy of your model file (and will automatically append the version number to the file if you choose to do so). You can read more about this [here](#).
  - A new printed report can now be produced that simply lists the Titles, numbers and descriptions for all versions. You can read more about this [here](#).
- For dialogs that consist of tables that must be scrolled beyond the provided dialog window, the mouse wheel can now be used to scroll up and down through the table.
- A command line option was added that runs GoldSim in "hidden mode", such that it runs as a background process, and is not actively seen on the desktop, while reporting the outcome as either success or failure using a process exit code and a log file. This is useful in cases where you want a separate program to run GoldSim (without the user being aware that it is being run). Among other uses, this allows you to stack up scheduled runs of GoldSim for execution (using a batch file) on a high-performance cloud environment and shut down the virtual system at the appropriate time (so as not to incur unnecessary costs). You can read more about this [here](#). (This was added in GoldSim 14 R3 but was an undocumented feature).
- Since GoldSim 14 R2, the Help has been web-based (the Help system is a web site, so it can constantly be updated). In GoldSim 15, the Help has been completely redesigned to make it easy to navigate and use (e.g., the Help system has direct links to PDF appendices). You can view the Help system [here](#).

- The documentation is also available in the form of PDF documents. These have also been completely redesigned to make them easier to navigate and use. You can access all of the PDF documents [here](#).
- A feature has been added that easily allows users to see if any updates to the software are available. This is accessed from the main menu via **Help | Check for Updates**. You can read more about this [here](#).
- A feature was added to export the interface definition for an External (DLL) element to a human readable file (in this case, in the form of an XML file). This could be useful for QA purposes or to facilitate integration into a custom solution. You can read more about this [here](#).

In addition to these changes, a very large number of additional minor modifications (e.g., user-interface improvements) and bug-fixes were implemented in GoldSim 15. A full listing of these is provided in the Release Notes Notes (accessible under Help in the main menu).

## Conversion Issues When Reading and Running Existing Models

All GoldSim models saved in 10.5 and later can be successfully read by GoldSim 15.

Converting models from 10.5, 11, or 11.1 to GoldSim 15, however, is potentially more time-consuming (i.e., in some cases may result in some conversion issues that will need to be addressed after reading in the model). This is due to significant changes in the GoldSim framework and functionality between earlier versions and GoldSim 12. These conversion issues are discussed in [GoldSim 11 Summary Document](#), the [GoldSim 11.1 Summary Document](#), and the [GoldSim 12 Summary Document](#).

Note also that while GoldSim 15 can read in models made in earlier versions (GoldSim 10.5 and above), those earlier versions cannot read a file that was saved in GoldSim 15.

If you are having any difficulty converting a model to GoldSim 15, do not hesitate to contact us at the [GoldSim Help Center](#).