

# SCT 2.0: System Control Table

## 1.0 Introduction

The RiverWare SCT (System Control Table) is a customizable, editable “spreadsheet” view of series data (series slots) in a RiverWare model. The SCT presents series data in a scrollable grid of numeric values. Background colors are used to indicate each slot timestep’s flag value—generally an indication of how the numeric value was created.

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The actual data displayed in an SCT is associated with the loaded RiverWare model rather than with the SCT. Therefore, editing series data displayed in an SCT does not affect the SCT—it affects only the RiverWare model.

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The information associated with an SCT—i.e., that which can be saved and reloaded as an SCT—consists essentially of:

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1. A list of RiverWare slots.
2. A few configurable display properties for each of those slots.
3. A set of general configurable display properties for the overall SCT.
4. An aggregation definition for aggregating multiple timesteps within each slot.

[Main Menu](#)

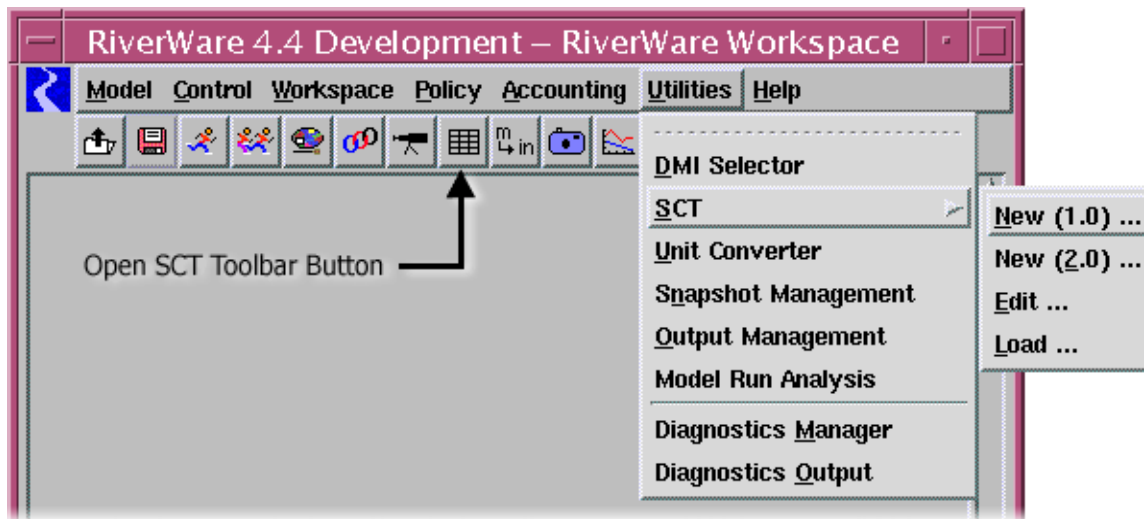
The time range displayed by the SCT matches the RiverWare model’s [Run Control](#) configuration—plus a configurable number of pre- and post-simulation timesteps.

Many SCTs may be used simultaneously within a single RiverWare session (i.e., showing distinct views into the same RiverWare Model). A given SCT may be used with distinct, but similar, RiverWare models.

The SCT supports series data slots (RiverWare series slots, including **Agg Series Slot** columns, and **Table Series Slot** columns) on physical simulation objects and in the RiverWare accounting system.

## 2.0 SCT Tour

### 2.1 Opening an SCT



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Users can create a new SCT from the **RiverWare Workspace** menu: **Utilities** ➤ **SCT** ➤ **New (2.0) ...**. The SCT initially will have the user-defined default configuration.

After creating a new SCT, users will want to [add Slots and Slot Dividers](#).

Users can load an **existing** SCT from the RiverWare workspace either by clicking the **open SCT toolbar** button (see graphic, above) or from the menu:

**Utilities** ➤ **SCT** ➤ **Edit ...** (opens the SCT in Un-Locked mode).

**Utilities** ➤ **SCT** ➤ **Load ...** (opens the SCT in Locked mode).

The Open SCT toolbar button and the **SCT Edit ...** and **Load ...** menu operations cause an **Open File** dialog to display. If users select an SCT file created from the old SCT (version 1.0), then another dialog displays with the following notification:

This is an SCT 1.0 file. Would you like to migrate to the  
SCT 2.0 dialog or open this with the SCT 1.0 dialog?

Button: SCT 2.0

Button: SCT 1.0

Button: Cancel

Within the SCT (2.0) dialog, users can also load an existing SCT into that dialog (replacing the current SCT configuration) through the **File** ➤ **Load SCT ...** menu operation.

## 2.2 The SCT Dialog

### 2.2.1 Vertical Timestep Axis Orientation

Timestep	Hoover .Energy 1000 MWH	Hoover .Evaporation 1000 m3	Parker .Diversion cms	Parker .Energy 1000 MWH	Parker .Evaporation 1000 m3	Parker .Inflow cfs
5/12 24:00 Sun	128.42	2836.92	137.90	1.81	3920.88	184
5/19 24:00 Sun	125.19	2832.53	137.90	1.80	9802.89	186
5/13 24:00 Mon	19.30	2836.68	137.90	1.84	965.70	177
5/14 24:00 Tue	19.30	2835.76	137.90	1.80	1370.36	181
5/15 24:00 Wed	19.30	2834.84	137.90	1.61	1964.66	186
5/16 24:00 Thu	19.29	2833.92	137.90	1.42	1373.55	186
5/17 24:00 Fri	19.29	2833.00	137.90	1.68	1376.91	186
5/18 24:00 Sat	14.35	2832.53	137.90	1.81	1376.61	186
5/19 24:00 Sun	14.36	2832.53	137.90	1.80	1375.10	186
5/26 24:00 Sun	118.87	2828.78	137.90	1.62	9613.23	170

LakeMeadHooverDam.Energy [Column 0]  
1 value [1000 MWH] -- Value 19.30

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### 2.2.2 Horizontal Timestep Axis Orientation

Slot Label	Units	5/12 24:00 Sun	5/19 24:00 Sun	5/26 24:00 Sun	6/2 24:00 Sun
Lake Mead Hoover Dam					
Hoover Energy	1000 MWH	128.42	125.19	118.87	120.76
Mon 24:00	1000 MWH	21.20	19.30	16.99	16.98
Tue 24:00	1000 MWH	17.97	19.30	16.98	16.97
Wed 24:00	1000 MWH	22.11	19.30	16.98	16.97
Thu 24:00	1000 MWH	21.43	19.29	16.98	16.97
Fri 24:00	1000 MWH	21.31	19.29	16.98	16.97
Sat 24:00	1000 MWH	12.20	14.35	16.98	17.95
Sun 24:00	1000 MWH	12.20	14.36	16.98	17.95
Hoover Evaporation	1000 m3	2836.92	2832.53	2828.78	2824.54
Lake Havasu Parker Dar					

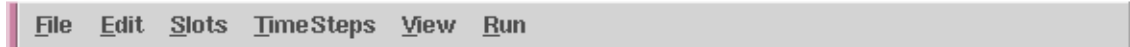
LakeMeadHooverDam.Energy [Column 0] [@ 5/14 24:00]  
1 value [1000 MWH] -- Value 19.30

## 2.3 Areas of the SCT

Window Title Bar :



Menu Bar :



Toolbar :

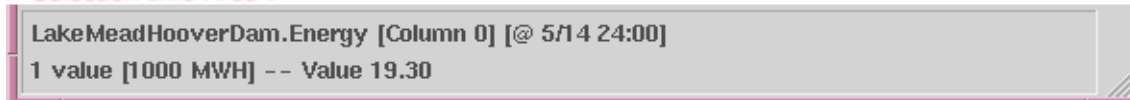


Row Header Table :

SCT Data Table / Column Headers :

	Slot Label	Units	5/12 24:00 Sun	5/19 24:00 Sun	5/26 24:00 Sun	6/2 24:00 Sun
	Lake Mead Hoover Dam					
▼	Hoover Energy	1000 MWH	128.42	125.19	118.87	120.76
	Mon 24:00	1000 MWH	21.20	19.30	16.99	16.98
	Tue 24:00	1000 MWH	17.97	19.30	16.98	16.97
	Wed 24:00	1000 MWH	22.11	19.30	16.98	16.97
	Thu 24:00	1000 MWH	21.43	19.29	16.98	16.97
	Fri 24:00	1000 MWH	21.31	19.29	16.98	16.97
	Sat 24:00	1000 MWH	12.20	14.35	16.98	17.95
	Sun 24:00	1000 MWH	12.20	14.36	16.98	17.95
▶	Hoover Evaporation	1000 m3	2836.92	2832.53	2828.78	2824.54
	Lake Havasu Parker Dar					

Selection Info Area :



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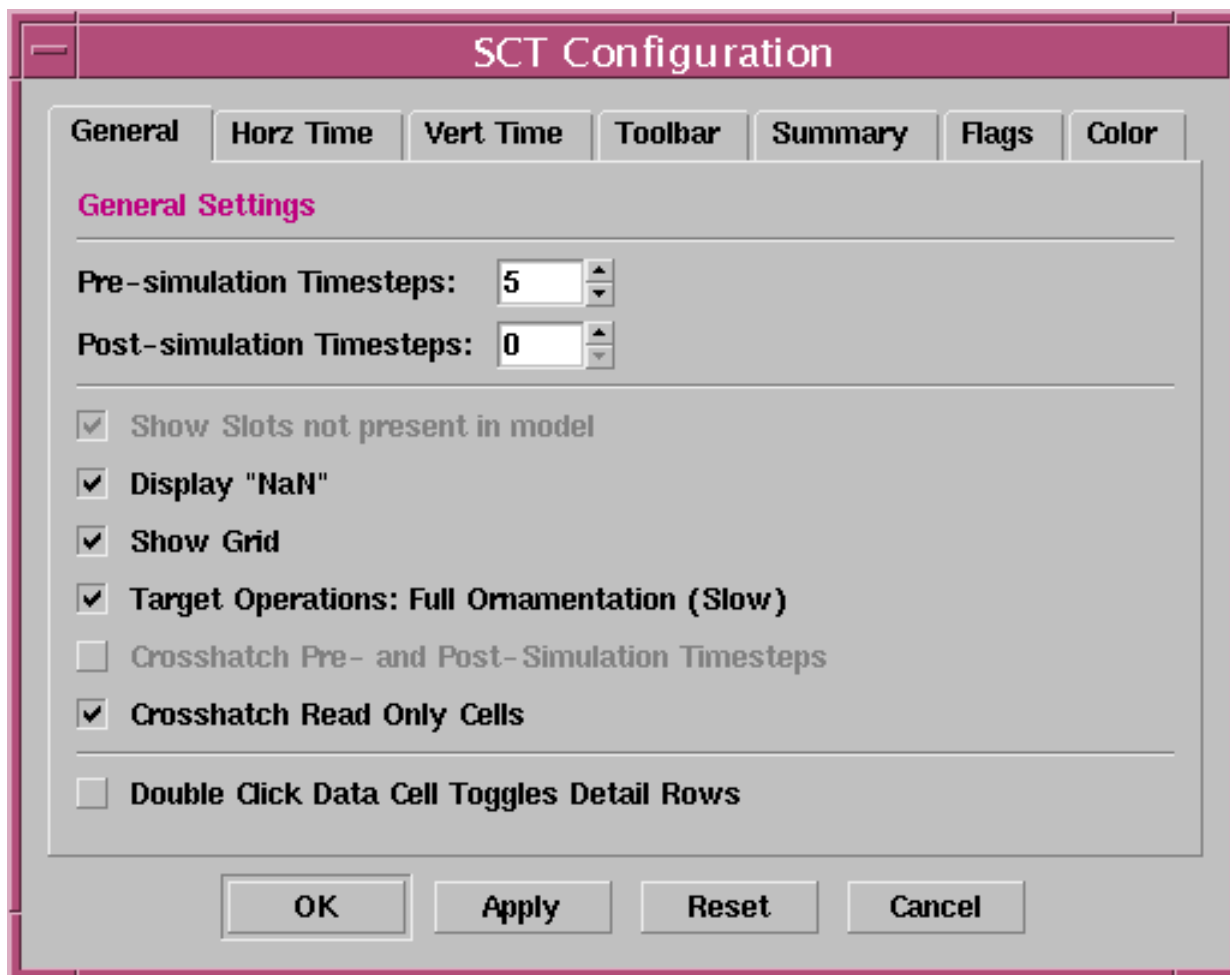
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## 2.4 Configuration Dialog

Most of the properties associated with an SCT are controlled through the **SCT Configuration** dialog, which users can access by selecting the SCT menu operation: [View](#) ➔ [SCT Configuration ...](#)

The various properties this dialog supports are described in sections corresponding to each of the tabbed pages:

[General](#) ... [Horizontal Time](#) ... [Vertical Time](#) ... [Toolbar](#) ... [Summary](#) ... [Flags](#) ... [Color](#)



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## 2.5 Timestep Aggregation Dialog

When **Aggregated View** is selected, [aggregations of timesteps](#) within each slot can be displayed (in Summary cells).

To determine the number of timesteps displayed as a single value (e.g., as the Sum or Average of the aggregated timesteps) for aggregations, users should access the **SCT Timestep Aggregation** dialog.

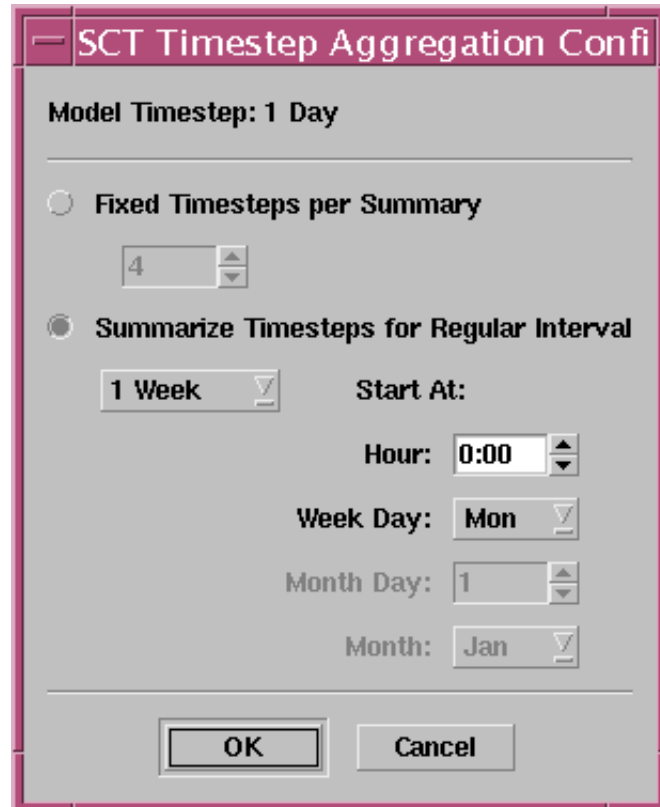
Users can display the **SCT Timestep Aggregation ...** dialog by accessing the SCT menu operation: [TimeSteps](#) ➔ [Aggregation Config ...](#)

The user can choose **Fixed Timesteps Per Summary** interval. This application assigns a specified constant number of timesteps for each aggregation. Aggregations start with the first timestep displayed in the SCT, which is the number of configured pre-simulation timesteps before the start date/time of the **Run Control**.

An alternative to a fixed timestep interval is **Summarize Timesteps for Regular Interval**, which lets users set a specified amount of time with a start offset. Users select the aggregation interval size—which should be larger than the timestep interval size—and **Start At:** (offset) settings. The accompanying graphic shows a weekly aggregation starting on Monday morning (at midnight).

With interval aggregation, the number of timesteps per aggregation can vary for the following reasons:

- Monthly aggregations will have various numbers of timesteps. Other irregular relationships between aggregation and timestep intervals are also possible.
- The first aggregation will have fewer timesteps if the first timestep displayed in the SCT isn't at the beginning of a regular interval aggregation (with respect to the selected offset).
- The last aggregation will have fewer timesteps if the last timestep displayed in the SCT does not fall at the end of a regular interval aggregation (with respect to the selected offset).


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## 3.0 SCT concepts

### 3.1 Numeric Values

Although numeric slot (time series) values are stored internally as double-precision floating point numbers, values are presented in the SCT (and elsewhere in the RiverWare user interface) with a display precision set on each slot. Display precision is a non-negative integer that specifies the number of fractional decimal digits (to which the internal value is rounded). The SCT uses a slot's display precision for all data cells. Currently, the SCT does not provide the ability to alter a slot's display precision value. (A slot's display precision can be changed in the slot's **Open Slot** dialog).

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A slot's values display in its configured user units. The SCT does not provide the ability to change user units of slots. (These can, however, be changed in the slot's **Open Slot** dialog).

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If users select a single value, it is redundantly displayed with model precision in the [Toolbar Value Edit](#) field, where it can also be edited. Model precision is not necessarily the full precision of the internal value (which may be represented in units that differ from the user units). Model precision is defined as having six (6) fractional decimal digits (and expressed in user units).

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Slot values can be in an undefined state. Depending on an SCT Configuration, undefined values can be displayed as “NaN” (which stands for “Not a Number”) or as blanks ([General Tab](#)).

### 3.2 Slots and Slot Dividers

Either rows or columns (depending on the current [axis orientation](#)) correspond to RiverWare slots and slot dividers.

RiverWare slots are identified with a [fully qualified name](#) (including the name of the simulation object, account, or other entity the slot is on) and an optional column number with which the SCT attempts to match up an actual slot in the currently loaded RiverWare model. SCT slot items for which a match cannot be found are indicated as disabled—no data is shown, and users can not provide data for such slots. Properties associated with slot items (within the SCT configuration) include:

1. Single-line Slot Text Label (used when slots are shown as rows).
2. Multiple-line Slot Text Label (used when slots are shown as columns).
3. Slot Column Width (in pixels) (used when slots are shown as columns).
4. [Summary Function](#) for computing the value shown for aggregates of timesteps within the particular slot.

**Slot Dividers** are rows or columns (depending on the current [axis orientation](#)) that users can place between (or above the first or after the last) slot row or column. The user can [choose one particular background fill color](#) for all slot dividers.

1. When slot dividers display as rows, they are tall enough for a line of text. In this orientation, users can place text in the **Slot Label** field of the slot divider (row). When the SCT is unlocked, users can edit slot divider row text by double-clicking in that field.

2. When slot dividers display as columns, they are drawn as thick lines. In this orientation, users cannot place text within the slot divider (columns).

In the next two graphics, listed below, slot dividers display as bright blue. Each graphic shows two slot dividers:

- [Picture: Vertical Timestep Axis Orientation](#) (slots and slot dividers are columns)
- [Picture: Horizontal Timestep Axis Orientation](#) (slots and slot dividers are rows)

How To:

- [Add or Remove Slots and Slot Dividers](#)
- [Move Slots and Slot Dividers](#)

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### 3.3 Slot Names and Slot Labels

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**Slot Names** are what RiverWare uses to refer to a particular slot symbolically. Generally, the slot name includes the simulation object or account that the slot is on. Users cannot change a slot's name within the SCT. (In general, slots cannot be renamed. One exception is slots defined on a data object.) In the SCT, users do not enter a slot name (text) to refer to a slot. Instead, slots are picked using one of two different slot selectors. [Read more about Adding Slots and Slot Dividers to the SCT.](#)

**Slot Labels** are arbitrary text strings that users can use to label a slot within a particular SCT. Two slot labels text strings are associated with a slot item: (1) a single-line text string for use when slots are shown as rows, and (2) a (potentially) multiple-line text string for use when slots are shown as columns. In the horizontal timestep axis orientation (where slots are rows), if the SCT is unlocked, users can edit a slot label in-line. In either orientation, users can edit a slot label by selecting the slot (e.g., by selecting a data cell within the slot) and by choosing the SCT menu operation: [Slots](#) ➔ [Set Label / Function ...](#) (Again, the SCT must be unlocked).

**Slot Labels** are always visible within the SCT as either row or column headers. If the current SCT selection includes only a single slot, the name for a slot displays in the **Selection Info** area (at the bottom of the SCT).

In these [two examples](#), one slot is selected (by virtue of one of its timesteps being selected).

1. Its **Slot Label** is **Hoover Energy**.
2. Its **Slot Name** is **LakeMeadHooverDam.Energy** (see bottom of SCT).

### 3.4 Timesteps

The SCT supports series slots (including **Agg Series Slots** and **Table Series Slots**). These represent time series data—an array of values representing measurements of one particular quantity at approximately equally spaced time intervals. (Technically, however, although monthly timesteps are not equally spaced, these are also supported.)

Only slots with a timestep interval matching the RiverWare Model's [Run Control](#) timestep interval can be displayed in the SCT. This applies to most series slots in a model.



However, the timestep range of slots in an SCT do not have to match **Run Control**: SCT cells corresponding to a timestep on a slot that is out of that slot's defined range display merely as blank. (The timestep range of slots in an SCT is the contiguous range of timesteps for which values are defined on a particular slot defined by the slot's begin time and end time.) A slot's timestep range automatically extends when users enter a numeric value in a data cell that is out of that slot's timestep range.

Conversely, the displayed timestep range of the SCT—the model's current run control timestep range plus the indicated number of pre-simulation and post-simulation timesteps—may not cover the complete timestep range of slots displayed in the SCT. When this occurs, a special ornamentation (an upper-left or lower-right corner triangle) on the slot's first and/or last cells indicate the presence of obscured (hidden) timestep values for that slot. [Read about How to Display Obscured Pre- and Post-Simulation Timesteps.](#)

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Within the SCT, timesteps are generally laid out in the opposite axis as slots. The only exception to this is the [Aggregated View](#) (see next section) in [Horizontal Timestep Axis Orientation](#), where timesteps within a single aggregation are laid out vertically but the overall arrangement of timesteps is horizontal.

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### 3.5 Timestep Aggregation

For display (and certain data export) purposes only, groups of [timesteps](#) within each Slot can be aggregated and summarized as single numeric values within an SCT. Probably the most useful configuration for timestep aggregation is choosing an aggregation interval size larger than the timestep interval size—for example, a weekly aggregation of a daily timestep model. It's also possible to select a constant number of timesteps for each aggregation. An SCT can support only one aggregation definition (interval or timestep count) at any given time. Read more about the [Timestep Aggregation Dialog](#).

The SCT supports both non-aggregated and aggregated views. In non-aggregated views, every data cell displays the value of exactly one timestep (of one slot). Aggregated views have two types of data cells: **Detail** cells and (aggregation) **Summary** cells. (See the next section.)

### 3.6 Detail Cells and (Aggregation) Summary Cells

Aggregated SCT views (see [Timestep Aggregation](#)) display two types of data cells:

1. **Detail** cells display the value of exactly one timestep (of one slot), as do all cells in non-aggregated views.
2. **Summary** cells display the result of a particular [Summary Function](#) on the timesteps that make up a single timestep aggregation (on one slot).

In both [axis orientations](#), summary cells and detail cells have the same relative arrangement: an aggregation's detail cells (showing each of the individual timesteps within the aggregation) are laid out immediately below the aggregation's single summary cell. Also, the two types of cells are laid out in rows—i.e., **Summary Rows** and **Detail Rows**—though the correspondence of those rows to the same slots versus the same timesteps differs in the two axis orientations.

In the aggregated views, summaries always display and details can be displayed or hidden. (The non-aggregated views display only details without summaries).

### 3.7 Summary Functions

Users can select a distinct **Summary Function** for each slot in an SCT. This selection is part of the **SCT Configuration** (i.e., not stored with the slot in the RiverWare model). The function is applied to the set of timesteps within each [timestep aggregation](#) on the slot. The result of the function, as applied to a particular timestep aggregation, displays in a [Summary cell](#).

The program supports the following **Summary Functions**:

- First value
- Nth value (particular 'n'—e.g., 5th)
- Last value
- Sum
- Average
- Median
- Minimum
- Maximum

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For the arithmetic functions, undefined values (NaNs) are ignored.

Note: Since **Median** requires a sorting of values, this can slow down the speed of SCT refreshes. If there is an even number of non-**NaN** values, the **Median** is defined as the average of the middle two values.

How To:

- [Change a Slot's Summary Function](#)

### 3.8 Axis Orientation

Users can swap the two SCT axes by clicking on the **Swap Axis Toolbar Button**. (See graphic.) Also, users can select the axis orientation by clicking on the [TimeSteps](#) ➔ [Axis Orientation](#) menu radio buttons.

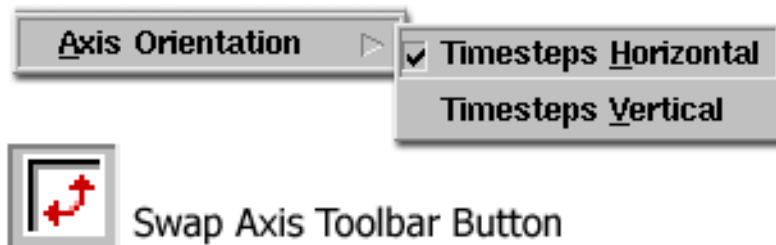
The two axes are slot items ([Slots and Slot Dividers](#)) and time ([TimeSteps](#)).

Users can display both axis orientations as **Aggregated** or **Non-Aggregated** views. (See [Timestep Aggregation](#)).

The axis orientations are referred to in the user interface and in SCT documentation as:

**Vertical Timestep Axis Orientation** ([See aggregated view example](#))

TimeSteps Menu ...



Slots are Columns

Timesteps or Timestep Aggregate Summaries are Rows

**Horizontal Timestep Axis Orientation** ([See aggregated view example](#))

Slots are Rows (or groups of Rows)

Timesteps or Timestep Aggregates are Columns

**Aggregated Horizontal Timestep Axis Orientation** is the classic view supported by the old SCT. This is also the most complicated view because (1) overall, timesteps increase to the right (horizontally); (2) however, within a single timestep aggregation (for a set of rows of [detail cells](#) corresponding to a single slot), timesteps increase downward (vertically).

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### 3.9 Slot Selection

There are two distinct, unrelated ideas of slot selection relative to the SCT.

When users want to [add Slots](#) that exist in the currently loaded RiverWare model to the SCT, they select such slots via one of the **Slot Selector** dialog boxes. [Read more about Adding Slots and Slot Dividers to the SCT.](#)

Apart from that [\[?\]](#), once a slot is represented within the SCT, users will select certain data cells within the slot, or the whole slot row or column, to perform operations on the Slot, such as setting values or flags. This is the more usual way of selecting a slot in the SCT. For users' purpose of referring to a slot in the context of some operation, selecting any number of cells within the slot is sufficient. [Read more about Slot operations in the SCT Slots menu.](#)

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### 3.10 Two Types of Pasting

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As a view into a RiverWare model, an SCT isn't exactly a spreadsheet. The primary intended uses of the SCT are:

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- to prepare a model with user-supplied constants (values and Flags) for a model run.
- to examine the results of a model run.

The default paste operation (Ctrl-V) (and the **Paste** toolbar button) pastes only **Input Semantics** values into the current selection. Values computed as a result of a model run are not pasted. Specifically:

- Input flagged values are pasted to the destination timesteps with the **Input Flag**.
- The final timestep value of a **Target Operation** is copied to the destination with the **Target Flag**, and the **Begin Target** is pasted if an explicit **Begin Target** timestep was defined (but only if the entire **Target Operation** was included in the copied selection).
- **Best Efficiency (B)**, **Max Capacity (M)**, and **Drift (D)** flagged timesteps in the copied (source) selection are pasted as undefined (NaN) values in the destination timesteps but with the source flag.
- Other timesteps are cleared—that is, set to NaN with an **Output Flag**.

The [Edit](#) ➔ [Paste as Input](#) (Ctrl-N) operation pastes all defined (non-NaN) values from the copied (source) selection to the destination timesteps, assigning the **Input Flag** to those values. Undefined (**NaN**) values from the copied (source) selection are pasted as **NaN / Output Flagged** values in the destination timesteps.

How To:

- [Copy a Single Value to Many Timesteps](#)
- [Copy Multiple Values](#)
- [Copy a Timeslice across all Slots](#)
- [Copy a Whole Slot](#)
- [Copy Data to the Clipboard](#) (e.g., to Excel).

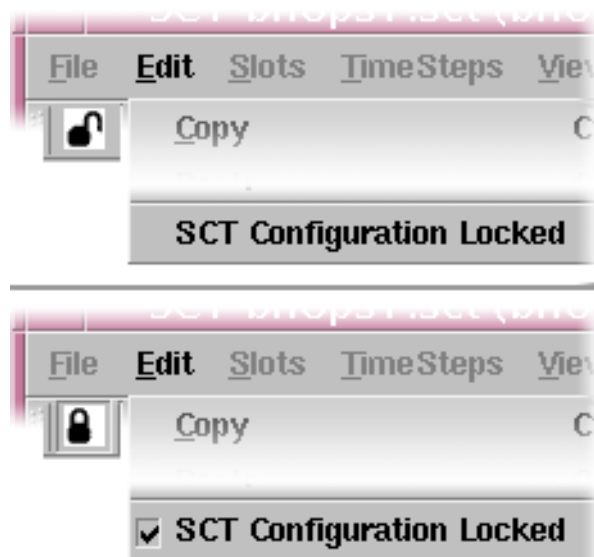
## 4.0 How To—SCT Configuration

### 4.1 Lock or Unlock the SCT Configuration

When the SCT is locked, the following components of the SCT configuration cannot be changed:

- The list of slots and slot dividers. Thus, slots and slot dividers cannot be added, removed, or moved.
- **Slot Labels** and **Horizontal Slot Divider Labels**.
- Slots' **Summary Functions** (for the aggregated views).

The SCT can be locked or unlocked by clicking the **Toolbar Locked** toggle button or the [Edit](#) ➔ [SCT Configuration Locked](#) menu toggle button.

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## 4.2 Add Slots and Slot Dividers

The SCT maintains a list of slot items (symbolic references to slots and slot dividers). Depending on the [axis orientation](#), these are laid out as rows or as columns.

To add slots or slot dividers, [the SCT must be unlocked](#).

Only actual slots that exist in the currently loaded RiverWare model can be added to an SCT. Through one of the two RiverWare slot selectors users can select slots they want to add.

Slots and slot dividers can be inserted into the SCT using the [Slots menu](#):

- before the selected slot.
- after the selected slot.
- at the end of the **Slot / Slot Divider** list.

### Slots Menu ...



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For the purpose of determining the insertion point for an added slot, a reference slot is regarded as [selected](#) if one or more timesteps within the slot are selected. The **Insert Before** and **Insert After** operations are disabled if users select more than one reference slot—unless the SCT is empty, in which case the insertion operations are unconditionally enabled.

## 4.3 Remove Slots and Slot Dividers

To remove slots or slot dividers, [the SCT must be unlocked](#).

Removing a slot from the SCT neither removes it from the RiverWare model nor affects the slot's data.

Users can remove multiple slots and slot dividers at any time. Those [selected](#) when users operate the [Slots](#) ➔ [Delete Slots / Dividers](#) operation are removed from the SCT.

Since slot dividers don't have any associated data cells, they are a bit more difficult to select than slots are. Therefore, it is necessary to select a slot divider in the **Row** or **Column** header.

## 4.4 Move Slots and Slot Dividers

To move slots or slot dividers, [the SCT must be unlocked](#).

Slots and slot dividers can be copied, cut, and pasted (inserted or appended) within an SCT or between SCTs. The data copy and paste operations (under the SCT Edit menu) are not related to the slot and slot divider moving operations. Instead, the following operations under the SCT [Slots menu](#) are used:

**Slots** ➤ **Copy Slots / Dividers**

At least one slot item must be selected.

**Slots** ➤ **Cut Slots / Dividers**

At least one slot item must be selected.

**Slots** ➤ **Insert Copied Slots / Divs**

Exactly one slot item must be selected.

**Slots** ➤ **Append Copied Slots / Divs**

No particular selection is required.

The **Cut Slots / Dividers** operation immediately deletes the selected slots. If users don't perform a subsequent **Insert Copied Slots / Divs** or **Append Copied Slots / Divs** operation, the slot items that were cut no longer exist in the SCT.

The **Insert Copied Slots / Divs** operation inserts the previously copied or cut slot items immediately *before* the single selected slot item.

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The **Append Copied Slots / Divs** operation appends the previously copied or cut slot items to the end of the SCT's slot item list (after the last slot row or after the last slot column, depending on the [axis orientation](#)).

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The cell ornamentation (crosshatch) displayed on the copy data cell set does not apply to the **Copy Slots / Dividers** operation. No special ornamentation displays for the slot items being copied.

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There is no problem with having a slot represented redundantly within an SCT (e.g., as a result of inserting or appending a slot reference into the same SCT from which it was copied). One reason users may want to do this is to see two or more distinct [Summary Functions](#) (e.g., **Sum** and **Average**) for aggregates of a particular slot.

## 4.5 Change a Slot's Summary Function

Read about [Summary Functions](#).

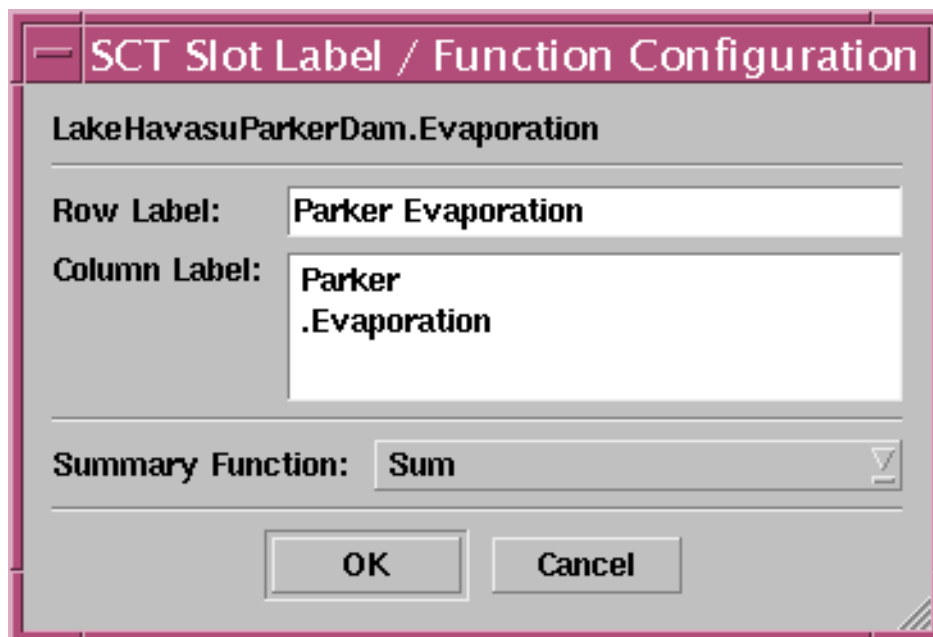
To change a slot's **Summary Function**, [the SCT must be unlocked](#). When the SCT is unlocked, there are two ways to change a slot's **Summary Function**.

(a) In the [Aggregated Horizontal Timestep Axis View](#), if the **Summary Function** column in the **Row Header Table** is shown ([see the SCT Configuration Horizontal Time Tab](#)), users can double click in the slot's **Summary Function** field to show an option menu with the available **Summary Function** choices.

To read more about showing the **Summary Function** column in the **Aggregated Horizontal Timestep Axis View**, also see: [How to Configure Row and Column Headers](#)

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(b) A slot's **Summary Function** can also be changed by [selecting a single slot](#) and choosing the [Slots ▸ Set Label / Function ...](#) menu operation. This displays the dialog box shown here. The user can select a different choice from the **Summary Function:** option menu.



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## 4.6 Show or Hide (Aggregation) Summaries

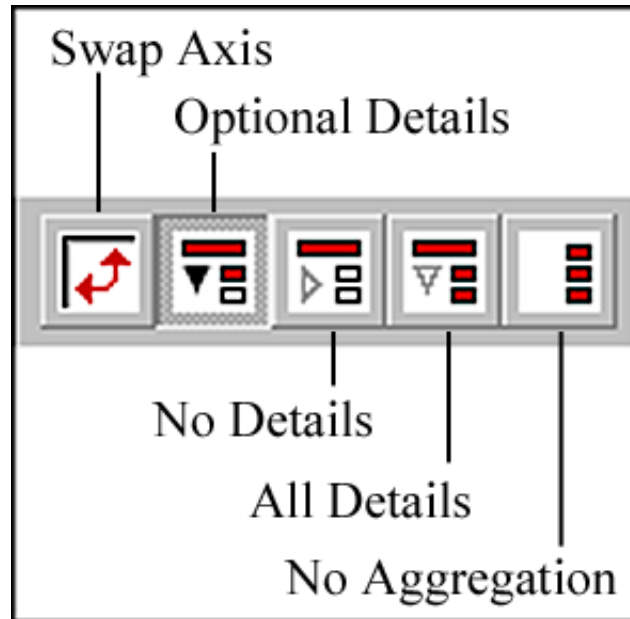
Read about [Timestep Aggregation](#) or about [Detail Cells and \(Aggregation\) Summary Cells](#).

Summaries (summary cells) always display in the aggregated—not in the non-aggregated—views. To display or hide summaries, users merely need to switch to the appropriate view in either of these ways:

Select one of the detail modes from the SCT [TimeSteps menu](#):

- ☐ **Show/Hide Details** (shows summaries)
- ☐ **Hide All Details** (shows summaries)
- ☐ **Show All Details** (shows summaries)
- ☐ **No Aggregation** (hides summaries)

By accessing the detail mode toolbar buttons, users can display or hide summaries by selecting a detail mode using those buttons.



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## 4.7 Show or Hide Details

Read about [Timestep Aggregation](#) or about [Detail Cells and \(Aggregation\) Summary Cells](#).

All details (detail cells), and only details, display in the non-aggregated views. Thus, users can display all details by selecting the **No Aggregation** detail mode either through the [TimeSteps menu](#) or by accessing the detail mode toolbar buttons (see above).

In the **Aggregated Horizontal Timestep Axis Orientation View**, each summary row corresponds to one slot. Therefore, showing or hiding the details for a single summary row displays or hides the details for one slot.

In the **Aggregated Vertical Timestep Axis Orientation View**, each summary row corresponds to one timestep aggregation. The detail rows under a summary row represent the individual timesteps within each timestep aggregation. Details for a single summary row that users display or hide correspond to one timestep aggregation across all slots (where each slot is in a separate column).

In the aggregated views in **Show/Hide Details (Optional Details)** detail mode, users can display or hide details (detail cells) independently for each summary row in the following three ways:

1. by using a treeview control (rightward or downward pointing triangle) on the left side of a summary row.
2. by entering Ctrl-D when one or more cells are selected. This sets the detail open/closed state to the opposite of the first slot or timestep aggregation represented in the cell selection.

Note: In this detail mode, users can display or hide all details by selecting a whole column and entering Ctrl-D.

3. If the following toggle on the [General Tab](#) of the [Configuration Dialog](#) is on, then double clicking in a cell toggles the detail open/closed state corresponding to the cell. (If this toggle is off, then double clicking in a data cell starts an in-cell modify-edit operation for the value in that data cell).

[x] Double Click Data Cell Toggles Detail Rows

Users can display or hide all details (detail cells) by selecting the **Show All Details** or **Hide All Details** detail modes from the SCT [TimeSteps menu](#) or by accessing the corresponding toolbar buttons. Selecting these modes does not affect the individual summary row detail open/closed states in the **Show/Hide Details** detail mode.

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## 4.8 Configure Row and Column Headers

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Since the correspondence between slots and times with rows and columns depends on the [axis orientation](#), the types of information that can be shown in row and column headers depends primarily on the selected axis orientation.

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The visibility of certain row header columns and types of information in data column headers is controlled separately for the two axis orientations through the use of two corresponding tabbed panes in the [Configuration Dialog](#).

- [Horizontal Time Tab](#)
- [Vertical Time Tab](#)

Only in the **Horizontal Timestep Axis Orientation** (where rows correspond to slots), the following two in-cell edit operations are supported when the [SCT is unlocked](#):

1. Editing a slot row label (by double-clicking).
2. Changing a slot's summary function (by double-clicking on the slot's summary function—if the **Summary Function** column is displayed — [read more](#)). Since summary functions are relevant only for the aggregated views, this application is available only in the **Aggregated (Horizontal)** view.

## 4.9 Adjust Column Widths

Users can manually resize columns by dragging the dividers between the column headers. The following four operations are also available in the SCT [View menu](#). Each is described below.

**View ➤ Set Data Column Widths**  
**View ➤ Fit Data Columns to Headers**  
**View ➤ Fit Data Columns to Data**  
**View ➤ Fit Row Header Column**

**View ➤ Set Data Column Widths** is used to set all data columns to the width of the single selected column. The best way to use this is to follow these steps:

- ☞ Manually resize one of the data columns to the desired width by dragging the column header divider on the right side of the column.

- ☞ Select the column by clicking in the middle of its column header.
- ☞ **Select View ➤ Set Data Column Widths.** This resizes all of the data columns to the width of the selected column.

**View ➤ Fit Data Columns to Headers** resizes all of the data columns to fit the text in the corresponding column headers.

**View ➤ Fit Data Columns to Data** resizes all of the data columns to fit the widest numeric value displayed in the corresponding columns.

**View ➤ Fit Row Header Column** resizes the columns in the **Row Header Table** to fit the widest content in the corresponding columns. This operation also adjusts the splitter between the **Row Header Table** and the **SCT Data Table** to fit the **Row Header Table** exactly.

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Many, though not all, of the column width adjustments are preserved when users save and reload an SCT.

## 4.10 Change Colors

Users can modify colors by selecting the [Flags Tab](#) or the [Color Tab](#) of the [SCT Configuration Dialog](#):

- ☞ From the SCT Menu, select [View ➤ SCT Configuration ...](#)
- ☞ Press the [Flags Tab](#) to modify flag colors.
- or
- Press the [Color Tab](#) to modify other colors.

Clicking one of the color buttons brings up a **Qt Color Chooser**. Users can change only one color at a time.

- ☞ To see the effect of the new chosen colors in the SCT, in the **SCT Configuration** dialog, click on **Apply**.
- ☞ To accept the changes, click on **OK**, or
- ☞ To cancel all changes since the bringing up the **SCT Configuration** dialog, click on **Cancel**.

Read about [saving the new settings as default, or restoring the default color settings](#).

## 4.11 Change Ornamentations

Users can configure the graphical ornamentations through settings in the [SCT Configuration Dialog](#). These settings are represented on various tabbed panes in that dialog.

- [General Tab](#) Toggle: **Display “NaN”**. If this is disabled, undefined numeric values are shown as blanks (empty cells).
- [General Tab](#) Toggle: **Show Grid**
- [General Tab](#) Toggle: **Target Operations: Full Ornamentation (Slow)**. This function should generally be enabled. If it is turned off, only the final timestep of **Target Operations** is shaded (solid with the configured [Target color](#)). This was introduced for very large models in which screen refreshes are slow.
- [General Tab](#) Toggle: **Crosshatch Read Only Cells** (e.g., expression slots and certain accounting system slots). Non-editable values are shaded with a crosshatch of a [configurable color](#).
- [Horz Time Tab](#) Toggle: **Draw Weekend Divider Columns**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle a Friday-to-Saturday or Sunday-to-Monday boundary in the **Horizontal Timestep Axis Orientation Views**. If enabled, **Weekend Divider** columns are drawn with the [configurable Weekend Divider color](#).
- [Horz Time Tab](#) Toggle: **Draw Month Divider Columns**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle the first and last timesteps of calendar months in the **Horizontal Timestep Axis Orientation Views**. If enabled, **Month Divider** columns are drawn with the [configurable Month Divider color](#).
- [Vert Time Tab](#) Toggle: **Draw Weekend Divider Rows**. This function lets users specify the drawing of thick lines between pairs of rows that straddle a Friday-to-Saturday or Sunday-to-Monday boundary in the **Vertical Timestep Axis Orientation Views**. In the **Aggregated Vertical Time View**, if the weekend boundary falls between detail rows that are hidden, then the divider is drawn as a dotted line immediately below the corresponding summary row. If enabled, **Weekend Divider** rows are drawn with the [configurable Weekend Divider color](#).
- [Vert Time Tab](#) Toggle: **Draw Month Divider Rows**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle the first and last timesteps of calendar months in the **Vertical Timestep Axis Orientation Views**. In the **Aggregated Vertical Time View**, if the month boundary falls between detail rows that are hidden, then the divider is drawn as a dotted line immediately below the corresponding summary row. If enabled, **Month Divider** rows are drawn with the [configurable Month Divider color](#).
- [Summary Tab](#): **Show Timestep Flag Colors** exclusive toggle buttons. This function lets users select the conditions under which flag values are indicated with background shaded regions in summary cells. **Always** is a good choice in most circumstances. This was introduced for two reasons: 1) to experiment with ways of distinguishing **Summary Rows** from **Detail Rows**, and 2) to support quicker screen refreshing with large aggregations—to the extent that turning off this ornamentation supports quicker screen refreshes.

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- [Flags Tab](#): Custom colors that indicate slot timestep flag values with background color shading. Users should choose flag colors that contrast with the **Foreground Text** color.
- [Color Tab](#): Other custom ornamentation colors.

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## 4.12 Change the Aggregation Interval

Users can change the **Aggregation Interval** by using the SCT [Timestep Aggregation Dialog](#). This dialog is shown through the SCT menu operation: [TimeSteps](#) ➔ [Aggregation Config ...](#)

## 4.13 Show Obscured Pre- and Post-Simulation Timesteps

The time range of the SCT depends on:

1. The time range of the loaded RiverWare model's **Run Control**.
2. The number of pre- and post-simulation timesteps configured for the SCT.

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It is quite possible that the time range of any particular slot starts before the first timestep shown in the SCT or ends after the last timestep shown in the SCT. When this occurs, a small corner triangle displays in the first or last **Summary** cell and the first or last **Detail** cell in that slot. If users select such a **Detail** cell, the number of obscured timesteps displays in the **Selection Info Area** at the bottom of the SCT.

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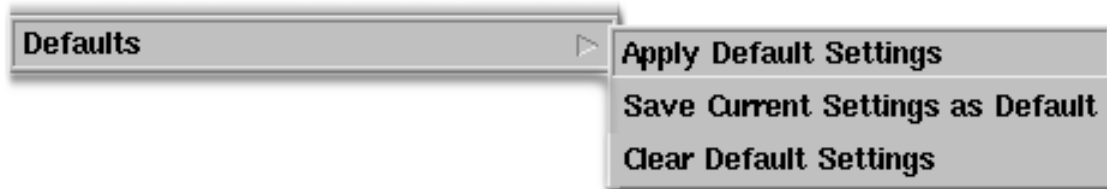
The only way to display a slot's obscured timesteps is to extend the time range of the SCT to cover the slot's full time range. This is done by selecting the [General Tab](#) of the [SCT Configuration Dialog](#). Users should observe the number of obscured timesteps (as described above) and increase either the **Pre-simulation Timesteps** count or **Post-simulation Timesteps** count by the required amount.

Users can also display a series slot's full range in that slot's **Open Slot** dialog (i.e., *instead of* viewing the full slot in the SCT). However, the initial version of the new SCT does not support directly showing that dialog for a slot. In order to do so, users would need to start at the RiverWare workspace, open the slot's object's **Open Object** dialog, and “drill down” to the slot's **Open Slot** dialog (possibly via the object's account tab if the slot is on an account).

## 4.14 Use the Default Configuration

Without a **Slot Item** list, users can save a single SCT configuration as a default SCT configuration. The default configuration is supported with these menu operations (from the SCT [View menu](#)) ...

View Menu ...



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**Apply Default Settings** applies the saved default settings to the current SCT. The SCT's **Slot Item** list (slot references and slot dividers) is not affected.

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**Save Current Settings as Default** saves the SCT configuration (without the **Slot Item** list) as the default configuration.

**Clear Default Settings** restores the default settings to the factory defaults. This does not affect the current SCT.

The default configuration is used when:

- creating a new SCT (see [Opening an SCT](#)).
- migrating an Old SCT (Version 1.0) to the new SCT.
- applying the default settings explicitly to the current SCT (via the [View](#) ➔ [Defaults](#) ➔ [Apply Default Settings](#) menu operation described [above](#)).

## 5.0 How To—Model Data Operations

### 5.1 Set a Single Value

Generally, users can directly edit data cells merely by beginning to type. The first typed digit keys replace the original value in the cell.

If users want to modify the value (e.g., correct a digit in the middle of a number), there are two options:

- ☞ Click in the cell, and then click in the **Toolbar Value Entry** field (at the top of the SCT) and edit the number there.

or

If the **Double Click Data Cell Toggles Detail Rows** option is turned off ([see the Configuration Dialog, General Tab](#)), then to start an in-cell modification edit, double click in the cell .

*Entering **n** or **nan** in either upper or lower case causes the value and flag to be cleared (i.e., set to the **Output** flag).*

Note: To abort an edit, press the Escape (**Esc**) key.

As soon as keyboard focus leaves the cell (e.g., when users press the **Enter** key or the **Tab** key, or when users click in another cell), and if the entered text represents a valid number (or is **N** or **NaN**), the program assigns the entered value to the slot timestep. If the text is not valid, then the program restores the cell to its original value.

If users enter a valid, defined (non-NaN) value, in addition to the numeric value being assigned to the slot timestep, generally the **Input Flag** is set. An exception: Cells with the **Target** flag initially set will retain that flag.

Even though the displayed precision is generally limited, the full precision that users type in—within the limits of a double precision floating point number (about 13 decimal digits)—is assigned to the underlying slot timestep,

Users cannot edit certain types of slots, including expression slots and certain accounting system slots. Pressing a digit key when a read-only data cell has keyboard focus has no effect. If users have enabled the **Read-Only** ornamentation ([see the Configuration Dialog, General Tab](#)), read-only data cells will be cross-hatched with a user configurable **Read-Only** color.

Note: The **SCT Lock** does not prevent modifications to slot data.

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## 5.2 Set Multiple Values

When users select multiple data cells (e.g., by dragging with the left mouse button, or by Shift- or Control-clicking data cells with the right mouse button), the most recently selected cell is ornamented as the active cell (with normal background shading and a heavy cell border) rather than as selected (with reverse-color background shading). Initiating and completing an edit of the active cell results in setting the entered value on each cell of the entire selection. In all other ways, editing the active cell within a multiple-cell selection behaves similarly to the [setting of a single value](#).

The multiple cell selection can include timesteps from slots having different unit types (e.g., **Flow** and **Area**). It is up to users to insure that the multiple-value setting operation makes sense.

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Since selecting a [Summary Cell](#) is equivalent to selecting all of the corresponding **Detail Cells**, an edit of a **Summary Cell** is implicitly a multiple-value edit operation.

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A special operation that also sets multiple values is [Edit](#) ➔ [Interpolate](#). This operation is active only if:

- all selected cells are within a single slot, and
- both the chronologically first and last timesteps have defined (non-NaN) values.

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**Edit ➔ Interpolate** sets all timesteps between the first and last timesteps to linearly interpolated values between the first and last timestep values in the standard units for the slot and assigns the **Input** flag to those values.

Note: Since the standard units for per-time values (e.g., flow values) are never per month, this avoids the potentially undesirable effect on the interpolation function due to the different amounts of time represented by different months.

### 5.3 Clear Values

Users can clear all editable values by selecting them and pressing the **Del** (delete) key. This operation is also available as a menu operation: **Edit** ➔ **Clear Values**.

When a value clears:

- Its value is set to NaN.
- Its flag is set to the output flag.

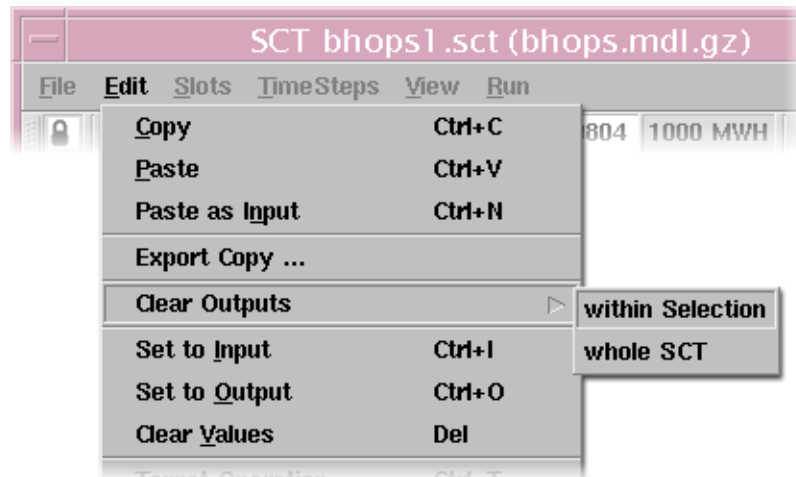
Two variants of a related function also result in the clearing of values:

- Edit** ➔ **Clear Outputs**
  - ➔ **within Selection**
  - ➔ **whole SCT**

**Clear Outputs** clears values that would generally be computed during a model run. The application sets to NaN timesteps with the following flags:

**Output (O), Best Efficiency (B), Max Capacity (M) and Drift (D)**

Note: The **SCT Lock** does not prevent the clearing of slot data.



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## 5.4 Set a Flag

Flags are properties associated with individual slot timesteps that are generally depicted in the SCT using background color shading.

The user can set the Input (I) and Output (O) flags on all editable slot timesteps, with the provision that the input flag can be set only on timesteps with a defined (non-NaN) value. Other flags can be set only on certain slots. The [Target Operation](#)—which sometimes involves coordinating pairs of internal flags on different timesteps—is discussed more in the next section.

The Flag Set operations are available in the [Edit menu](#) and as toolbar buttons that can optionally be shown or hidden, depending on settings in the [Configuration Dialog, Flags Tab](#). These operations are also available as keyboard accelerators:

(I)	Input	Ctrl+I
(O)	Output	Ctrl+O
(T)	Target	Ctrl+T
(B)	Best Efficiency	Ctrl+B
(M)	Max Capacity	Ctrl+M
(D)	Drift	Ctrl+Shift+~
(S)	Surcharge Release	Ctrl+S
(G)	Regulation Discharge	Ctrl+G

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If the current cell selection includes any slot that doesn't support a particular flag, the **Flag Set** operation for that flag is disabled. The disabled menu operations are indicated as grayed-out. The active **Flag Set** toolbar buttons are indicated with a black border. (Those buttons lacking a black border are disabled).

Note: The **SCT Lock** does not prevent the setting of flag values on slot timesteps.

## 5.5 Set a Target Operation

Users can apply a **Target Operation** to a single timestep or to a contiguous range of timesteps on the following types of slots:

- Reservoir, Storage
- Reservoir, Pool Elevation

If the **Target Operation** is applied to a single timestep (by [setting the Target Flag](#) on a single selected timestep), then that timestep is regarded as the final timestep of the **Target Operation**—and the first timestep is implied by the flag values in the preceding timesteps. (This implicit **Target Begin** timestep is determined during the model run). The **Set Target Flag** operation is enabled only if the value for that single timestep is defined (non-NaN).

If the **Target Operation** is applied to a range of timesteps within a slot (by selecting a set of data cells and operating the [set Target Flag operation](#)), then the earliest timestep is assigned the **Target Begin Flag** and the latest timestep is assigned the **Target (End) Flag**. The latest timestep must have a defined (non-NaN) value. In this sort of **Target Operation** (with an explicitly defined **Target Begin** timestep), the final target timestep is indicated with a solid background fill color (of the [user configured Target color](#)), and the previous timesteps have only a thick border of that color.

## 5.6 Copy a Single Value to One or Many Timesteps

Through the following four steps, users can copy a single timestep value to one or more timestep values on a slot having the same unit type. This works both within a single SCT or between SCTs. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

- ☞ Select (click in) the **source cell** (a [detail cell](#), or a data cell in a non-aggregated view—see [Note 1](#), below).
- ☞ Perform the copy operation in one of three ways:
  - Press Ctrl+C or
  - Select the **Edit ➔ Copy** menu operation or
  - Click the **Copy** toolbar button.

*The source cell will be marked with the **Copy Set Crosshatch** of a [user configured color](#).*

- ☞ Select (click in or, optionally, drag) the destination cell(s).
- ☞ Perform the paste operation in one of these ways:
  - Press Ctrl+V or Ctrl+N or
  - Select the **Edit ➔ Paste** or **Edit ➔ Paste as Input** menu operation or
  - Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation, which pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the two types of paste operations.](#)

The paste operations are enabled only if all of the destination cells are of the same unit type as is the source cell and if they are all editable (i.e., not read-only). (See [Note 2](#), below, regarding the handling of real values.)

**Note 1:** If the source cell is a [summary cell](#) (in an aggregated view), then generally this is equivalent to selecting multiple values (multiple timesteps), which would initiate the copy of multiple values—[discussed in the next section](#). One exception is a summary cell of the first or last timestep aggregation that happens to have only a single timestep, in which case the type of copying described in this section (“Copy a Single Value”) would apply.

**Note 2:** If the paste operation is enabled, then values that are pasted ([depending on the type of paste operation](#)) are assigned to the destination timesteps using standard units. This means that if the display units of the source and destination slots are different (e.g., cubic feet per second vs. cubic meters per second), then the pasted values will appear to be different than the source value (in the source cell). However, the quantities that those values represent will be the same.

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## 5.7 Copy Multiple Values

Users can copy a set of timesteps within a single slot to another time within the same slot or to a different slot having the same unit type. This works both within a single SCT or between SCTs. Users can repeat, any number of times, the third and fourth options (pasting) detailed below.

- ☞ Select (click in and, optionally, drag) the source cells. These can include all sorts of data cells, including summary cells. Timesteps indicated in the selection do not have to be contiguous because the program “remembers” the relative offsets between them.
- ☞ Perform the copy operation in one of three ways:
  - Press Ctrl+C or
  - Select the **Edit ➔ Copy** menu operation or
  - Click the **Copy** toolbar button.

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*The source cells are marked with the Copy Set Crosshatch with a [user configured color](#).*

To identify the earliest destination timestep, select (click in) a single cell . This cell can be any sort of data cell, including a summary cell. If users select a summary cell, the implied earliest timestep is the first timestep within the timestep aggregation represented by that summary cell.

Alternate operation: Instead of selecting a single cell to identify the earliest destination timestep, if users select a single whole slot, the implied destination timestep is the earliest timestep from the source timestep selection. This is accomplished differently in the two axis orientations:

In **Horizontal Timestep Axis Orientation** (where rows correspond to slots), users select a slot by:

- clicking in a row tab at the extreme left side of a summary row or
- if the SCT is locked, by clicking in any row header field within a summary row or in any row in the non-aggregated view.

In **Vertical Timestep Axis Orientation** (where columns correspond to slots), users select a slot by:

- clicking in a column header.

- ☞ Perform the paste operation in one of these ways:

- Press Ctrl+V or Ctrl+N or
- Select the **Edit ➔ Paste** or **Edit ➔ Paste as Input** menu operation or
- Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags and clears all the other destination timesteps. [Read more about the two types of paste operations.](#)

If there are timestep gaps in the source timestep selection, those gaps are honored by the paste operation. That is, the corresponding gaps in the destination will not be affected.

The paste operations are enabled only if the selection includes cells from just one slot. Pasting of defined values is performed using standard units. (Read more about this in [Note 2](#), in the [Copy a Single Value](#) section).

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## 5.8 Copy a Timeslice across All Slots

Within a single SCT, users can copy a set of contiguous timesteps across all slots to other timesteps. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

- ☞ Select (click in and, optionally, drag) the source timesteps.

In **Horizontal Timestep Axis Orientation** (where columns are timesteps or timestep aggregations), this is done by clicking and dragging in the column headers.

In **Vertical Timestep Axis Orientation** (where rows correspond to timesteps or timestep aggregations), this is done by clicking or dragging in the row tabs at the far-left side of each row.

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- ☞ Perform the copy operation in one of three ways:

- Press Ctrl+C or
- Select the **Edit ➔ Copy** menu operation or
- Click the **Copy** toolbar button.

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*The source timestep data cells will be marked with the **Copy Set Crosshatch** with a [user configured color](#).*

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- ☞ To identify the earliest destination timestep, select (click in) a timestep row or column (as in the first step, above).

- ☞ Perform the paste operation in one of these ways:

- Press Ctrl+V or Ctrl+N or
- Select the **Edit ➔ Paste** or **Edit ➔ Paste as Input** menu operation or
- Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the two types of paste operations.](#)

## 5.9 Copy a Whole Slot

Users can copy the series data of a whole slot to another slot in the same SCT or to a different SCT. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

☞ Select a source slot.

In **Horizontal Timestep Axis Orientation** (where rows correspond to slots), this is done by:

- clicking in a row tab at the extreme left side of a summary row, or any data row in the non-aggregated view or
- if the SCT is locked, by clicking in any row Header field within a summary row or in any row in the non-aggregated view.

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In **Vertical Timestep Axis Orientation** (where columns correspond to slots), this is done by:

- clicking in a column header.

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☞ Perform the copy operation in one of three ways:

- Press Ctrl+C or
- Select the **Edit ➤ Copy** menu operation or
- Press the **Copy** toolbar button.

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*The source timestep data cells will be marked with the copy set crosshatch with a [user configured color](#).*

☞ To identify the destination slot and earliest destination timestep, select (click in) a cell.

Alternate operation: Instead of selecting a single cell to identify the earliest destination timestep, if users select a single whole slot, the implied destination timestep is the earliest timestep defined in the source slot (regardless of the time range shown in the SCT). This is accomplished differently in the two axis orientations, as described in the first step, above.

☞ Perform the paste operation in one of these ways:

- Press Ctrl+V or Ctrl+N or
- Select the **Edit ➤ Paste** or **Edit ➤ Paste as Input** menu operation or
- Press the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the two types of paste operations.](#)



## 5.10 Copy Data to the Clipboard (e.g., to Excel).

It is possible to copy to the system clipboard the numeric values displayed in an SCT—and, subsequently, to paste those values into another application (e.g., Microsoft Excel or other spreadsheet).

This operation is more similar to the [Print Selection operation](#) than it is to the other copy operations. Data is copied with the displayed units and without reference to units (but, optionally, with greater precision).

To copy data to the system clipboard:

- ☞ Make any data cell selection in the SCT.

For the purposes of this operation, the minimum enclosing geometric (not chronological) rectangle around the selection is implied. In the aggregated views, summary rows are included only if all of their subordinate detail rows are included.

- ☞ Select the menu operation [Edit](#) ➔ [Export Copy ...](#). The **Export to Clipboard** dialog box displays. (See graphic, above right.)
- ☞ Select **Display** or **Model** data precision, and whether undefined values should be pasted as NaN (or as a blank).
- ☞ Click on the **Copy** button.

In the other application (e.g., Excel), perform a paste operation (from the system clipboard).

Note: The SCT does not yet support this type of paste.

Clipboard data format: ASCII-encoded decimal numeric values (or “NaN” for undefined values—if selected) within a row are separated with Tab characters. Rows are separated with New Line characters.



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## 6.0 How To—Printing, Plotting, Exporting Data

### 6.1 Printing

Users can print a graphical depiction of the SCT, or a subset of the SCT. From the SCT, only the **Row Header Table** and **SCT Data Table** (with column headers) are included. The printed-page header and footer contains some information about the SCT and RiverWare model.

There are three **File** ➤ **Print** menu operations:

1. **File** ➤ **Print** ➤ **Selection**
2. **File** ➤ **Print** ➤ **Page**
3. **File** ➤ **Print** ➤ **Full SCT**

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The **Print** ➤ **Selection** operation prints the minimum enclosing rectangle around the selection. In the aggregated views, summary rows are included only if all of their subordinate detail rows are included. This is similar to the [Copy Data to Clipboard](#) operation.

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The selection ornamentation (reverse colors) prints only through the **Print** ➤ **Page** and **Print** ➤ **Full SCT** operations.

### 6.2 Plotting

When users select the plot operation, the full, defined time range of the selected slots is plotted (on the screen), even if the slot selection is indicated with just one or a few cells (timesteps) within slots. Plotting is enabled only if no more than two unit types are represented within the selection.

Users can display a plot of the selected slots either by:

- selecting the [Slots](#) ➤ [Plot Slots ...](#) menu item or
- clicking the **Plot** toolbar button.

### 6.3 Exporting Data

The initial release of the SCT (2.0) does not support exporting data to files. However, see the [Copy Data to Clipboard](#) operation.

## 7.0 SCT Menu Bar

[File](#)  
[Edit](#)  
[Slots](#)  
[TimeSteps](#)  
[View](#)  
[Run](#)


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### 7.1 File Menu

The SCT **File** menu supports the following operations:

**Load SCT** lets users load a different **SCT** configuration file into the particular SCT.

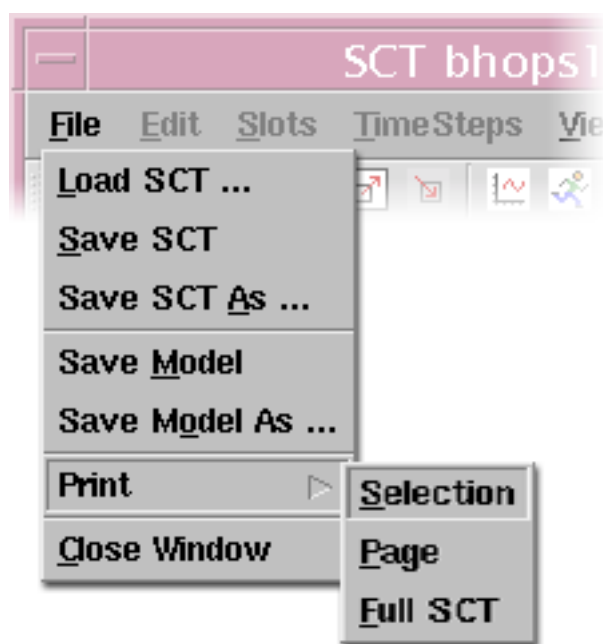
If users select an old SCT (1.0) SCT file, it is automatically migrated to the new SCT format (just for this SCT session, unless the SCT is resaved). In contrast to [opening an old SCT File from the RiverWare workspace](#), where users have the option of opening an old SCT using the old SCT dialog, users are not warned that an old SCT is being migrated. (Since this operation is performed from there, an assumption is made that the user wants to use the new SCT.)

**Save SCT** and **Save SCT As ...** saves the SCT's current configuration as an SCT file. **Save SCT** is enabled only if the SCT has a name (i.e., if it was opened from an SCT file or if it is a new SCT for which a **Save SCT As ...** operation has already been performed).

**Save Model** and **Save Model As ...** perform the same operations as the **Save** and **Save As ...** operations in the RiverWare workspace. They neither affect the SCT nor cause the SCT configuration to be saved.

**Print** operations are described in the [How to Print](#) section.

**Close Window** closes the SCT; however, this does not automatically save the SCT's configuration.


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## 7.2 Edit Menu

Described below are the operations that the SCT **Edit** menu supports.

The behavior of the **Copy** and **Paste** operations depends on the nature of the current selection within the SCT. Read more in these sections:

[Copy a Single Value to One or Many Timesteps ...](#) [Copy Multiple Values ...](#) [Copy a Timeslice across all Slots ...](#) [Copy a Whole Slot.](#)

The [Two Types of Pasting](#) section describes the difference between the default paste operation and paste as input.

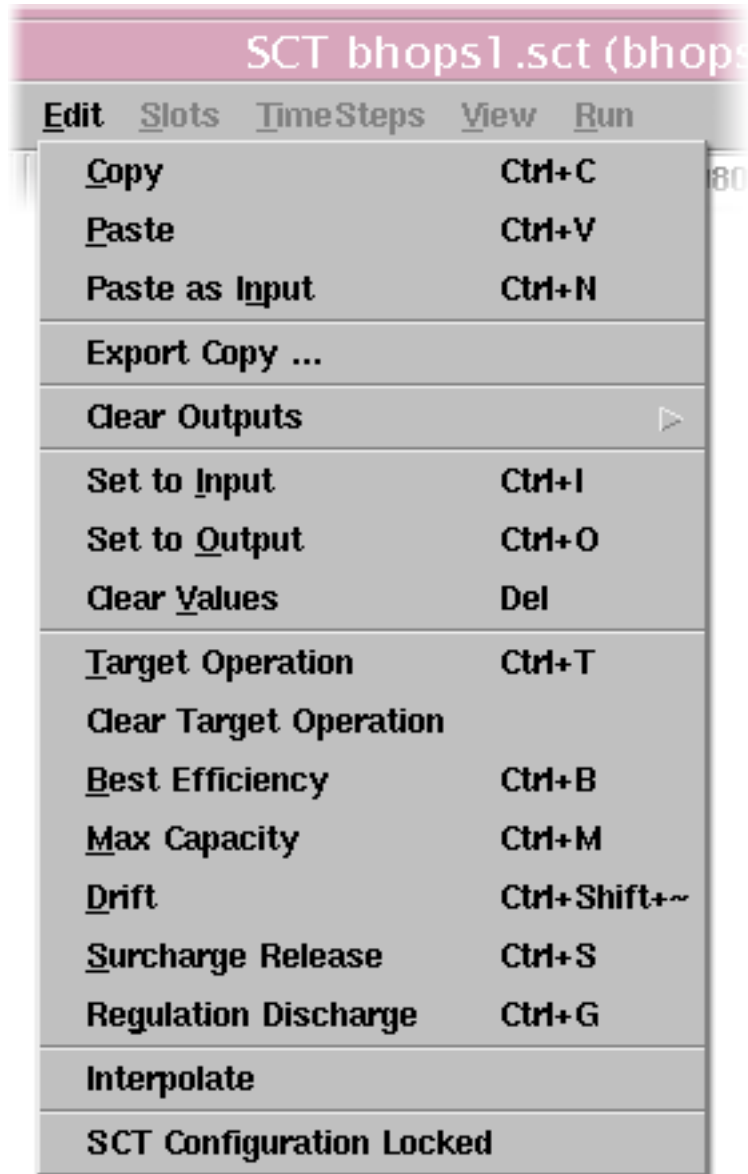
**Export Copy ...** is described in the [Copy Data to the Clipboard \(e.g., to Excel\)](#) section.

**Clear Outputs** and **Clear Values** are described in the [How to Clear Values](#) section.

The various flag setting operations are described in the [Set a Flag](#) and [Set a Target Operation](#) sections.

**Interpolate** is a special function described at the end of the [Set Multiple Values](#) section.

The **SCT Configuration Locked** toggle is described in the [Lock or Unlock the SCT Configuration](#) section.



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### 7.3 Slots Menu

The SCT **Slots** menu supports the following operations:

**Plot Slots ...** is described in the [Plotting](#) section.

**Enable Dispatching** and **Disable Dispatching** set the dispatching state of the simulation objects containing the current SCT slot selections. Slots on a simulation object with dispatching disabled are indicated with a crosshatch (of a [configurable color](#)) on slot labels in the row header table (in **Horizontal Timestep Axis Orientation** only).

**Insert Before**, **Insert After**, and **Append** are described in the [How to Add Slots and Slot Dividers](#) section.

The other copy, cut, insert, and append operations are described in the [Move Slots and Slot Dividers](#) section.

The **Delete Slots / Dividers** operation is described in the [Remove Slots and Slot Dividers](#) section.



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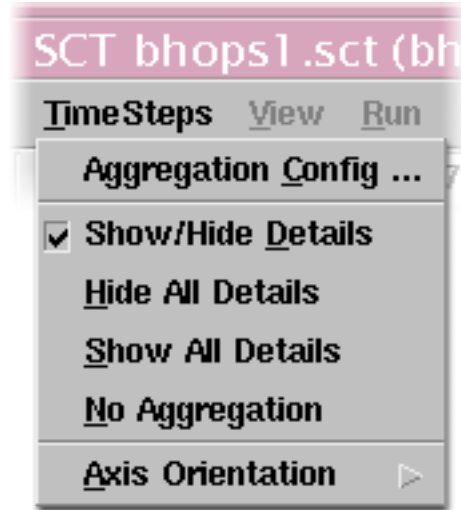
## 7.4 TimeSteps Menu

The SCT **TimeSteps** menu supports the following operations:

**Aggregation Config ...** shows the SCT [Timestep Aggregation Dialog](#).

The **Show/Hide Details**, **Hide All Details**, **Show All Details**, and **No Aggregation** exclusive toggle buttons select the SCT's detail mode. The first three choose the aggregated view of the currently selected **Axis Orientation** (see next item), and **No Aggregation** shows the corresponding non-aggregated view. These selections are described in the [Show or Hide \(Aggregation\) Summaries](#) and [Show or Hide Details](#) sections.

The **Axis Orientation** selections choose between horizontal timestep axis orientation (classic) and vertical timestep axis orientation (new with SCT 2.0). These are described in the [Axis Orientation](#) section.

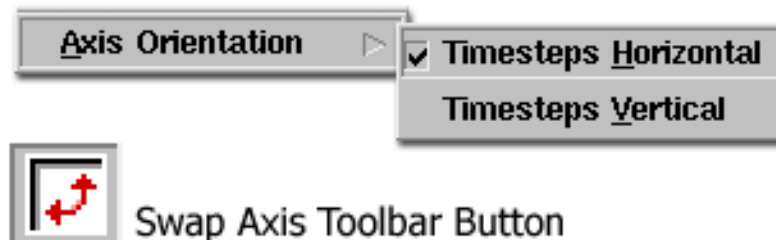


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### TimeSteps Menu ...



## 7.5 View Menu

The SCT **View** menu supports the following operations:

**SCT Configuration ...** displays the SCT [Configuration Dialog](#).

**Toggle Row Detail** is described in the [Show or Hide Details](#) section.

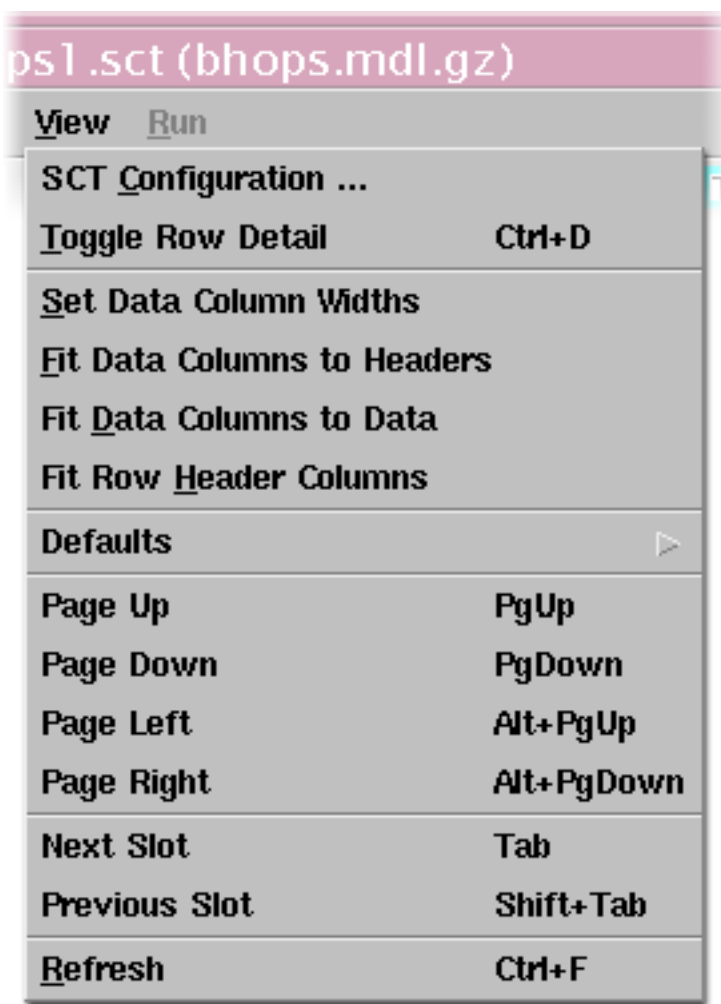
**Set Data Column Widths** and the various “fit column” operations are described in the [Adjust Column Widths](#) section.

The **Defaults** operations are described in the [Use the Default Configuration](#) section.

The various “page” operations scroll the SCT window in the indicated direction. Although users generally will access these via the indicated keyboard accelerators, these operations are included in this menu to document their implementation.

The **Next Slot** and **Previous Slot** operations move the active cell to the next or previous Slot.

Although selecting **Refresh** shouldn’t be necessary if the SCT is implemented correctly, this function is included to help users diagnose refresh problems, etc., should they occur.



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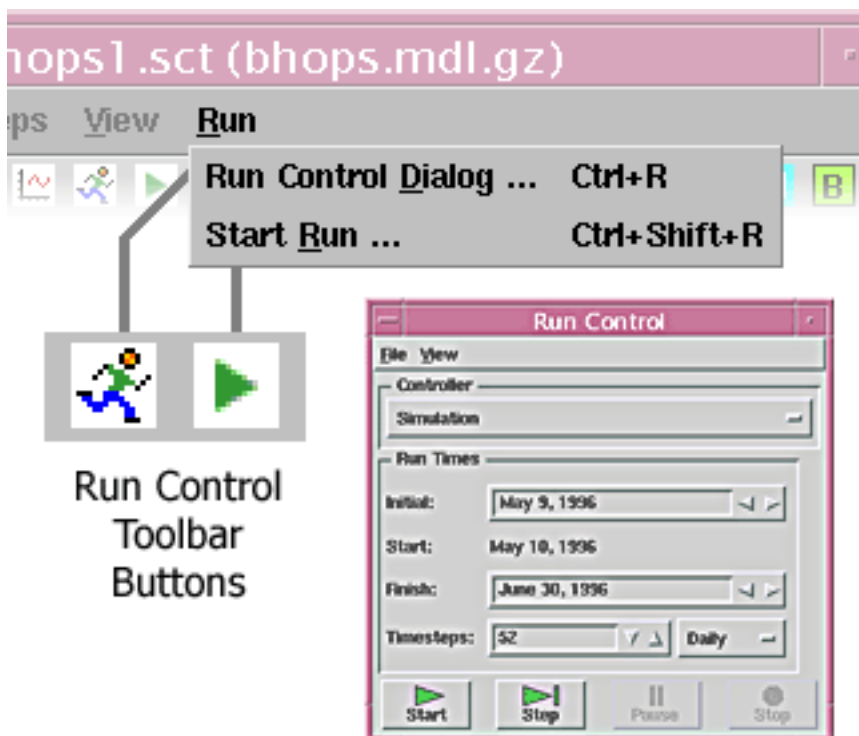
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## 7.6 Run Menu

The SCT **Run Control** menu supports the following operations:

**Run Control Dialog ...** shows the RiverWare Run Control dialog (also pictured here). The time range of the SCT is based on the time range specified in the **Run Times** section of this dialog. Read more in the [Timesteps](#) section.

**Start Run ...** initiates a model run using the controller and run times indicated in the **Run Control** dialog.



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## 8.0 Configuration Settings

[General](#) ... [Horizontal Time](#) ... [Vertical Time](#) ... [Toolbar](#) ... [Summary](#) ... [Flags](#) ... [Color](#)



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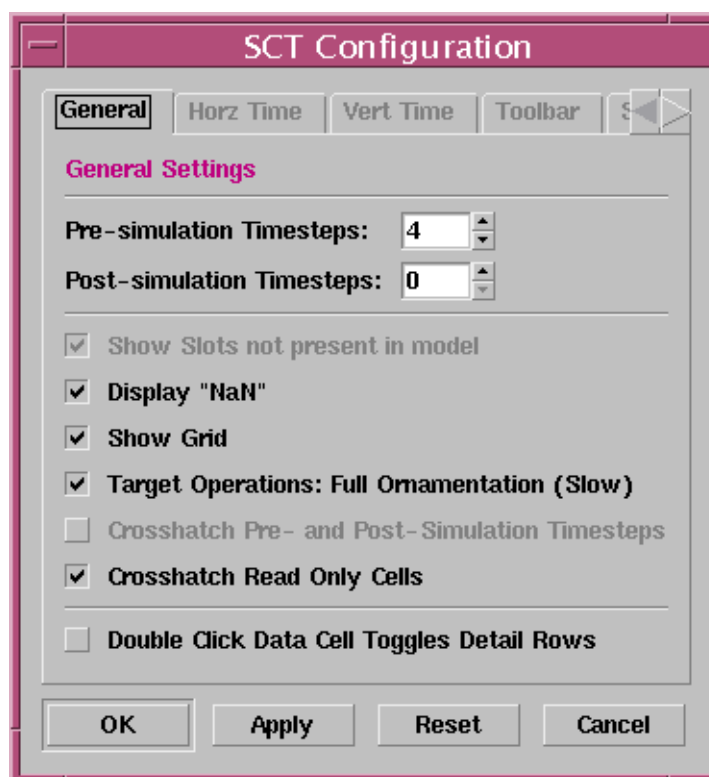
### 8.1 General Tab

The **SCT Configuration** dialog displays through accessing the SCT [View](#) → [SCT Configuration ...](#) menu operation.

The **Pre-simulation Timesteps** and **Post-simulation Timesteps** integer spinner values are used in the determination of the SCT's time range. The indicated timesteps number is added to the RiverWare model's [Run Control](#) time range. Read more about this operation in the [Timesteps](#) section.

The various display options in the middle area of the **SCT Configuration** dialog are described in the [Change Ornamentations](#) section. The following two settings are not supported:

- **Show Slots not present in model** (such slot items always display but are grayed out and do not show any data).
- **Crosshatch Pre- and Post-Simulation Timesteps**—not implemented.



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The **Double Click Data Cell Toggles Detail Rows** setting determines the behavior of double clicking in the SCT data table. Turning this option on replaces the default behavior of double clicking (i.e., initiating an in-cell modification-edit) with an open/close details operation. Although the latter functionality is relevant only for the aggregated views, for consistency the disabling of edit initiation is applied to the non-aggregated views anyway. Read more in the [Show or Hide Details](#) and [Set Single Value](#) sections.

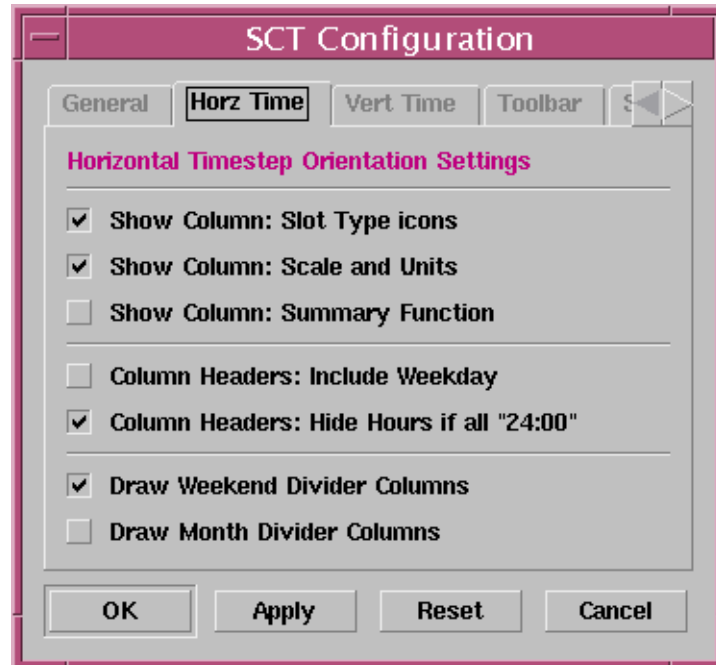
## 8.2 Horizontal Time Tab

Users can display the **SCT Configuration** dialog by accessing the SCT [View](#) ➔ [SCT Configuration ...](#) menu operation.

These settings affect the appearance of only the horizontal timestep axis orientation views.

The following sections include explanations of these settings:

- [Configure Row and Column Headers](#)
- [Change Ornamentations](#)



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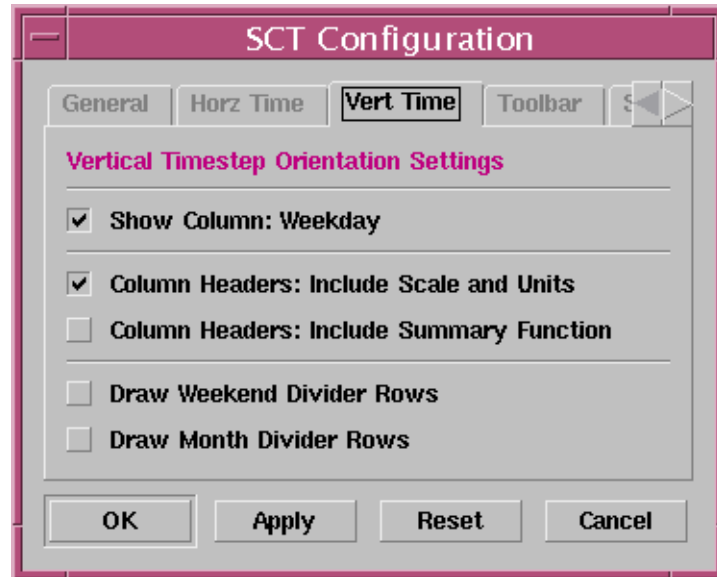
### 8.3 Vertical Time Tab

Users can display the **SCT Configuration** dialog by accessing the SCT [View >> SCT Configuration ...](#) menu operation.

These settings affect the appearance of only the vertical timestep axis orientation views.

The following sections include explanations of these settings:

- [Configure Row and Column Headers](#)
- [Change Ornamentations](#)



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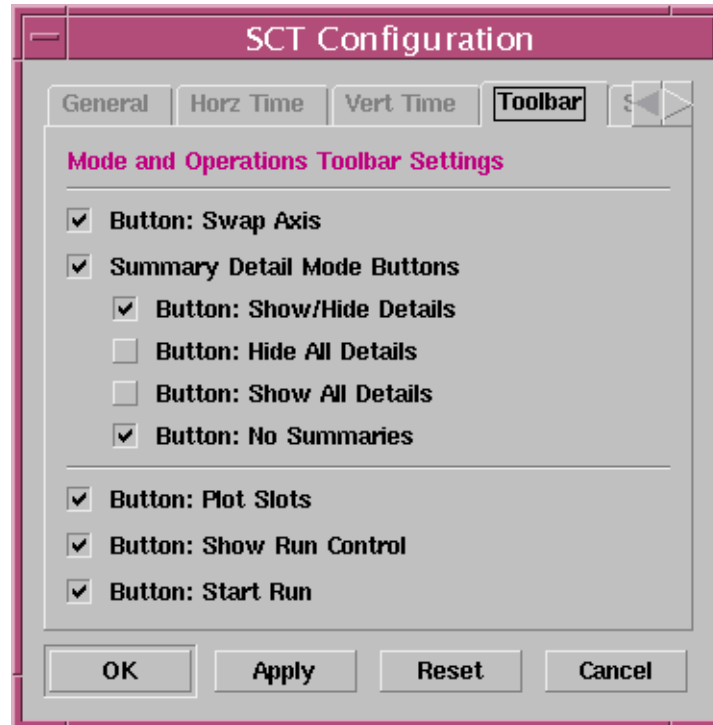
## 8.4 Toolbar Tab

Users can display the **SCT Configuration** dialog by accessing the SCT [View](#) ➔ [SCT Configuration ...](#) menu operation.

These settings determine whether individual toolbar buttons display in the [SCT Toolbar](#).

The operations associated with each of the configurable toolbar buttons are also represented in the [SCT menus](#).

To display the flag setting buttons within the SCT toolbar, users need to set this through the [Flags Tab](#) rather than through the **Toolbar** tab.

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## 8.5 Summary Tab

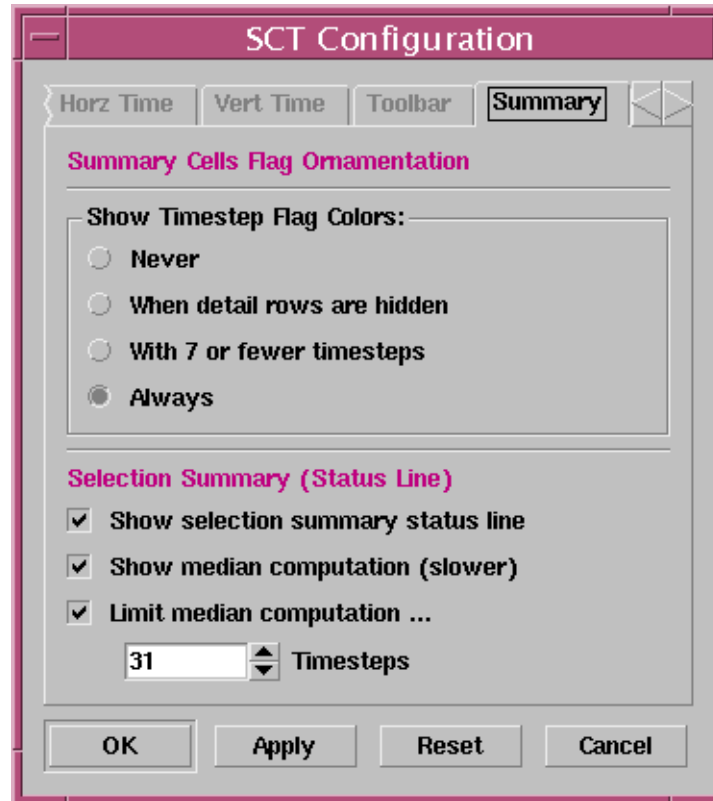
Users can display the **SCT Configuration** dialog by accessing the SCT [View](#) → [SCT Configuration ...](#) menu operation.

The settings on this tabbed pane were introduced mainly to experiment with ways of speeding up screen refreshes in very large models or in SCT configurations using a large aggregation (relative to the model timestep).

With typically sized models and aggregations, the benefit of disabling full functionality seems not to be significant.

The **Show Timestep Flag Colors:** options are described in the [Change Ornamentations](#) section.

The **Selection Summary (Status Line)** options disable or limit the second status line displayed at the bottom of the SCT. The last three components are used for limiting the median computation, which is the only statistic that requires a set of values to be sorted.


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## 8.6 Flags Tab

Users can display the **SCT Configuration** dialog by accessing the SCT [View](#) → [SCT Configuration ...](#) menu operation.

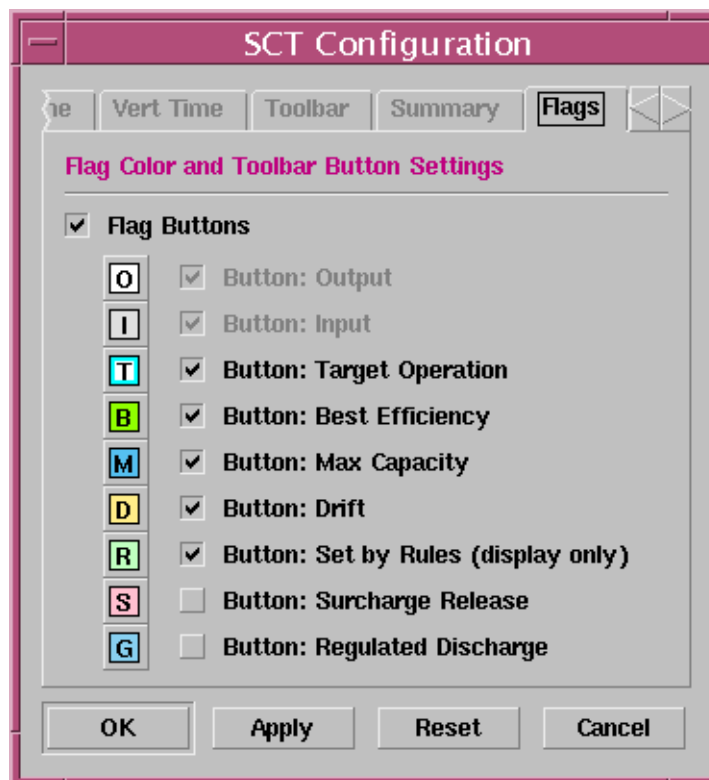
The **Flags** tabbed pane is used for two distinct types of settings related to the support of slot timestep flags in the SCT.

The various checkbox controls are used to determine the presence of the flag toolbar buttons in the [SCT Toolbar](#). If any such toolbar buttons are displayed, the **Input** and **Output** flag toolbar buttons are displayed unconditionally. In other words, unless no flag toolbar buttons display—i.e., if the [Flag Buttons](#) toggle is on—then the **Output** and **Input** flag buttons will unconditionally be displayed.

Also see the [Toolbar Tab](#) for the configuration of the presence of other Buttons in the Toolbar.

The colored buttons on the [Flags](#) tabbed pane are “copies” of the flag toolbar buttons. They illustrate the appearance of the flag toolbar buttons, based on the current [Foreground Text](#) color and the background shading color currently selected for the respective timestep flag values. Clicking on the colored buttons here brings up a color chooser, allowing users to select a different color for that flag. Read more in the [Change Colors](#) section.

For information about the configuration of other colors used in the SCT that users can set, also see [Color Tab](#).


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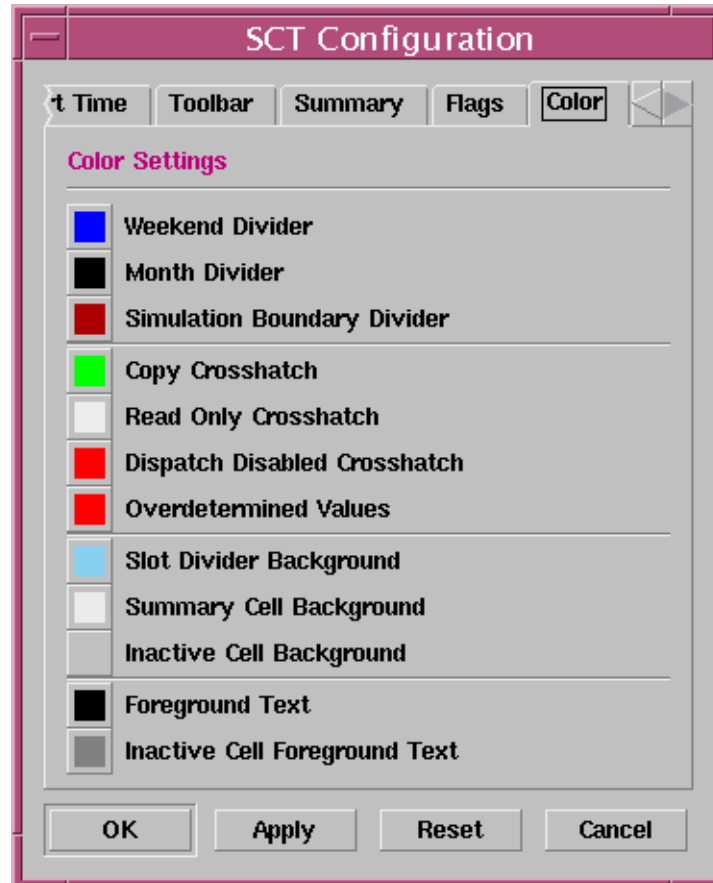
## 8.7 Color Tab

Users can display the **SCT Configuration** dialog by accessing the SCT [View](#) → [SCT Configuration ...](#) menu operation.

The **Color Settings** tabbed pane lets users configure colors used in the SCT (other than flag colors that are set on the [Flags Tab](#)).

For an explanation of these settings, refer to the following sections:

- [Change Ornamentations](#)
- [Change Colors](#)

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