



Technical Documentation Version 7.2

Script Management



Center for Advanced Decision Support for
Water and Environmental Systems (CADSWES)

UNIVERSITY OF COLORADO **BOULDER**

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Script Management

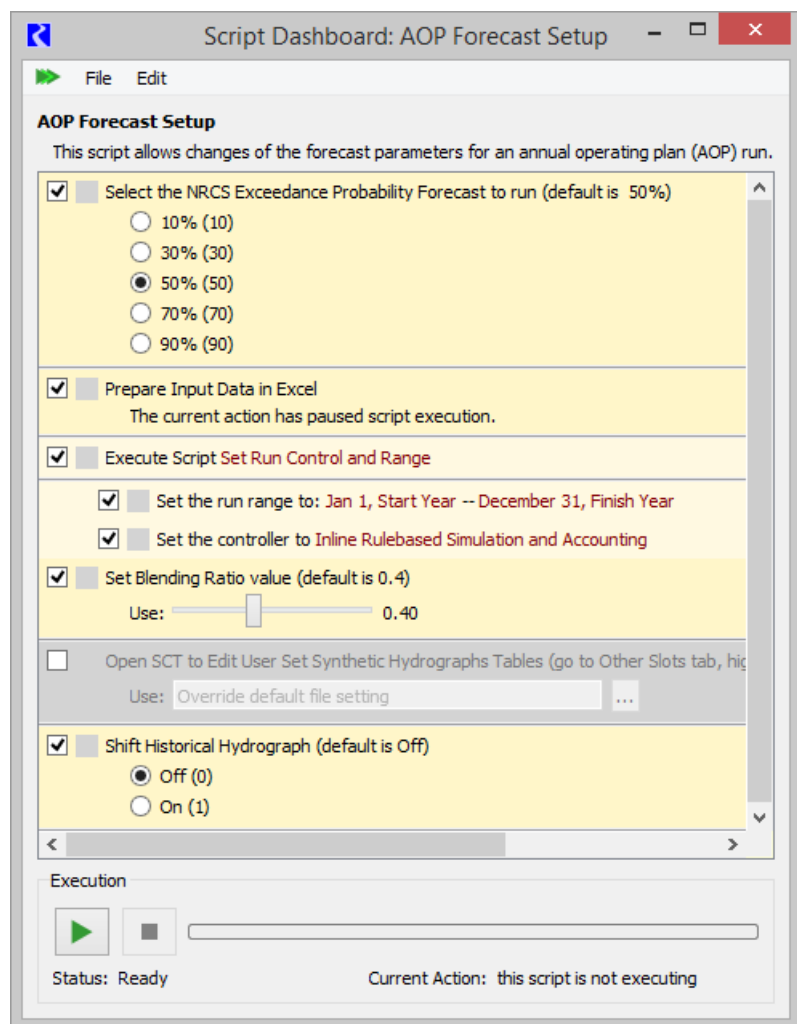
1. Overview

Scripts allow you to organize and run sequences of actions. This allows you to automate many of the tasks involved in operating a model. For example, the script shown to the right changes the run range, sets a value that represents the type of run, changes the controller, sets a date trigger referenced by rules, allows you to select a forecast percentage, changes a method selection, and clears a slot's flags. This section presents key Script features and provides some examples of how they might be used.

1.1 Features

Like the model itself, in a typical application the script will be created and configured once and then executed many times. In our discussion of Scripts, we use the term “modeler” to refer to the person who defines and configures the script and the term “user” for the person who runs the script.

- The modeler creates scripts in the **Script Manager** and then configures each script in its **Script Editor**.
- Scripts are composed of a series of **Actions**, each of which represents a single step to be taken by the script, such as setting the run controller, setting a slot value, running a DMI or loading a ruleset.
- After an action has been added to a script in the **Script Editor**, the precise behavior of the action can be controlled by editing its settings.
- Any action that is not of interest to the user can be configured as hidden.



- The **Script Dashboard** lists the associated script's visible actions and allows the user to override key configuration settings before running the script. Convenient controls such as radio buttons, sliders, and toggles, are provided for manipulating configuration settings.
- **Scripts** are saved to the model file but can be exported/imported to other models.
- From both the **Script Editor** and **Script Dashboard**, right-click context menus allow you to directly open the slot or object dialogs when the action refers to slots or objects.
- A script can execute another script (using the **Execute Script** action). Only one level of a script calling another script is allowed.

1.2 Uses

Now that you know some of the features of scripts, why might you use them? Following are some applications or use scenarios:

- Update a model to a new time range. For example, at the beginning of the year, advance the model's run range, import new data, and set desired operation triggers.
- Prepare a model for the current day's run. In one click of a button, clear yesterday's proposed operations, import observed data, load the necessary rulesets and goal sets so the model is ready to run.
- Change an after-the-fact accounting model into an operations or planning model. Run a script to change the controller, load an alternative ruleset, modify object methods, and set slot values.
- Provide the model to stakeholders who can use the Script Manager to specify their desired inputs. They then run a script that executes the model.

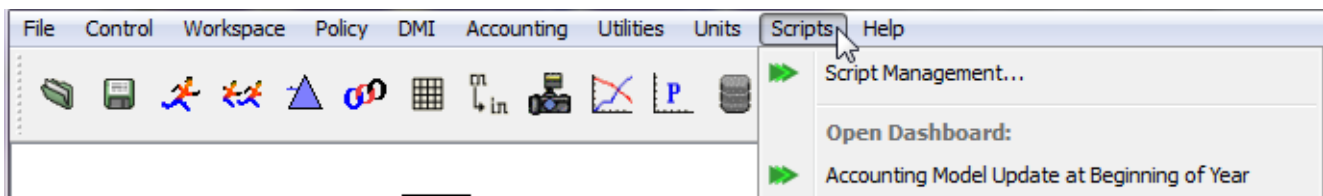
This document describes the **Script Manager**, **Script Editor**, and **Script Dashboard** including all of the action types and settings. Running scripts is described [HERE \(Section 4\)](#).

2. Managing Scripts

The **Script Manager** is used to create, export/import, and delete scripts.

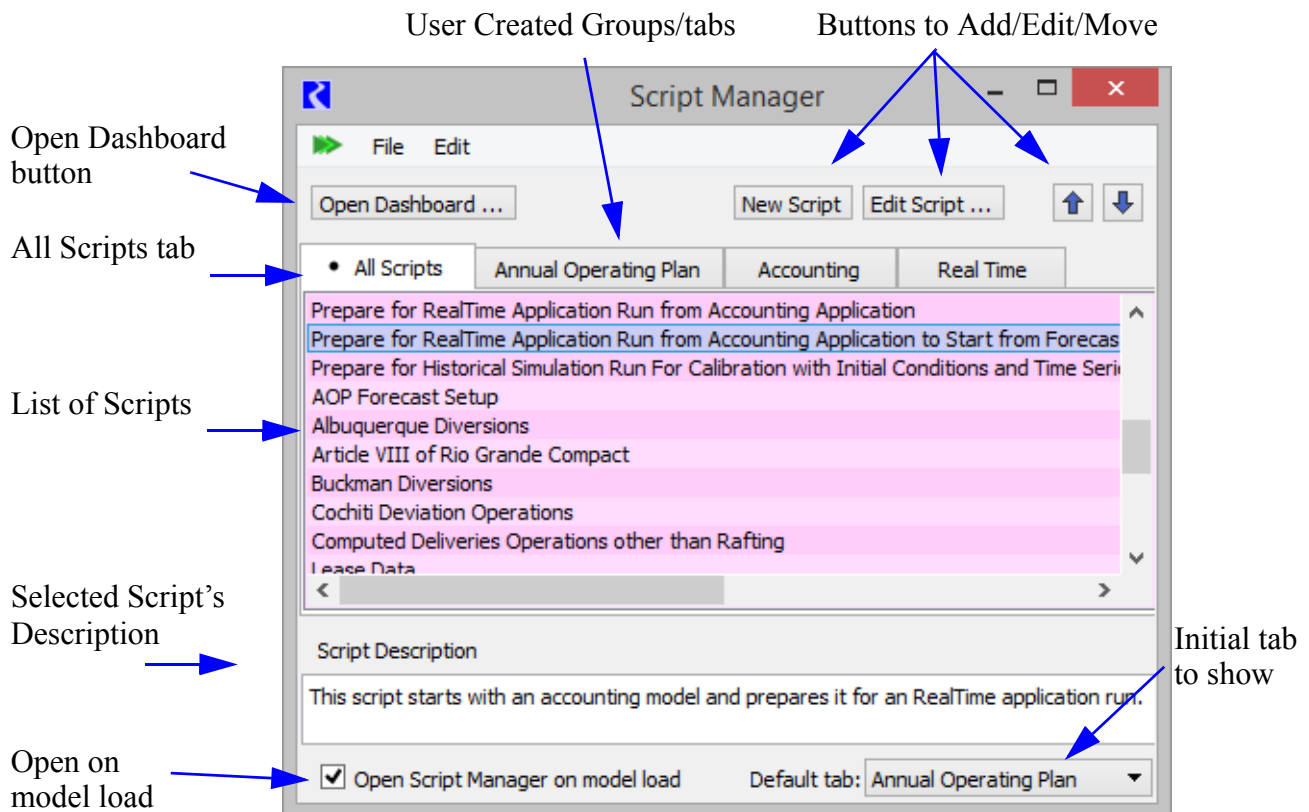
2.1 Accessing the Script Manager

To access the Script Manager, from the workspace, use the **Scripts** ➤ **Script Management...** menu. When there are scripts defined, the name of each script will show up in the Script Management menu. Click on the name to open the **Script Dashboard** for that script.



2.2 Tour of the Script Manager

The **Script Manager** contains lists of the defined scripts in the model. These scripts are all shown on the **All Scripts** tab as shown in the screenshot. In addition, you can create your own tabs or groups as described [HERE \(Section 2.3\)](#).



Within any of the tabs, use the **Edit Script...** button to open the **Script Editor** as described [HERE \(Section 3\)](#). Use the **Open Dashboard...** button or double-click a script to open the Script Dashboard as described [HERE \(Section 4\)](#).

The **All Scripts** tab contains the complete list of scripts, and it is the only group from which new scripts can be created or scripts can be deleted. When on the All Scripts tab, use the **New Script** button to create a script. Use the options in the **Edit** menu to delete an existing script.

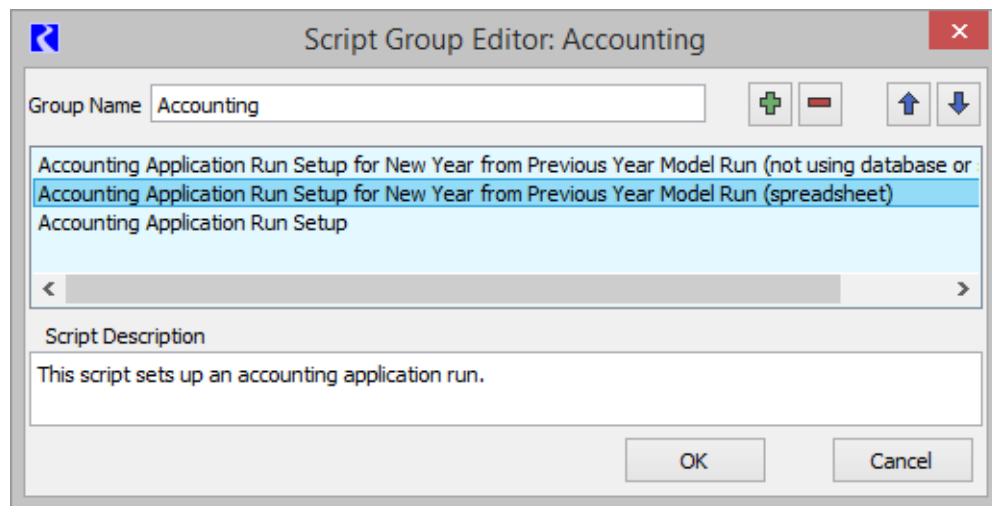
The lower portion of the **Script Manager** shows the selected script's description. This allows you to quickly see the description to know what the script does or why you would want to use it. The descriptions are edited as part of the script: [HERE \(Section 3.1\)](#).

The **Script Manager** can be configured to automatically open upon loading a model by checking the **Open Script Manager on model load** toggle. You can specify which script group tab is initially displayed by selecting a script from the **Default tab** menu. The **Default tab** is shown when the Script Manager window is initially opened (either upon model load or manually) within a RiverWare session.

2.3 Working with Script Groups

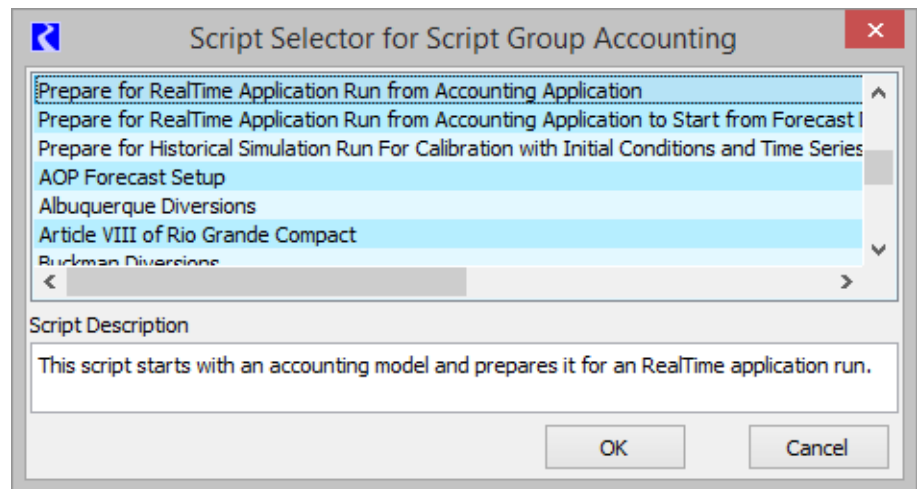
To create a user-defined script group, use the Script Manager's **Edit ➔ New Group...** menu. To modify an existing user-defined group, select the tab and then use the **Edit ➔ Edit Group** menu item. Both of these menu items open the **Script Group Editor**, shown to the right.

The **Script Group Editor** lists the scripts within the group and you can add, remove and reorder the scripts within the group.



To add a script to the group, click the green plus button. This opens the **Script Selector**, which lists those scripts not already included in the script group. Select one or more scripts and click OK to add the scripts to the group.

Within the Script Manager, you can re-arrange the tab groups by dragging a tab to a new position.



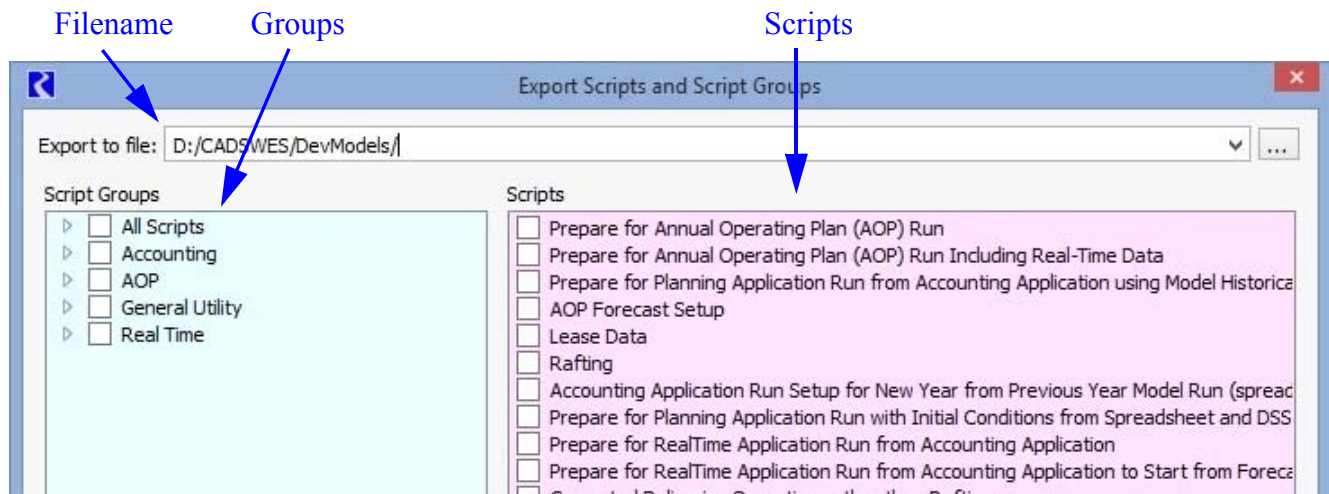
Note: A script group does not “own” the scripts listed as within the group. Instead, the group is simply a set of references to existing scripts. Thus, a script can be shared by multiple groups, and the effort of developing a new script need not be duplicated in order to immediately include and use a script in other groups.

2.4 Import/Export of Scripts

One or more Scripts or Script Groups can be exported from the model and then imported into another model. This section describes this process

2.4.1 Export Scripts

From the Script Manager, use the **File** ➔ **Export Selected Script** to export one or more scripts or groups to a file. This opens the Export Scripts and Script Groups dialog:

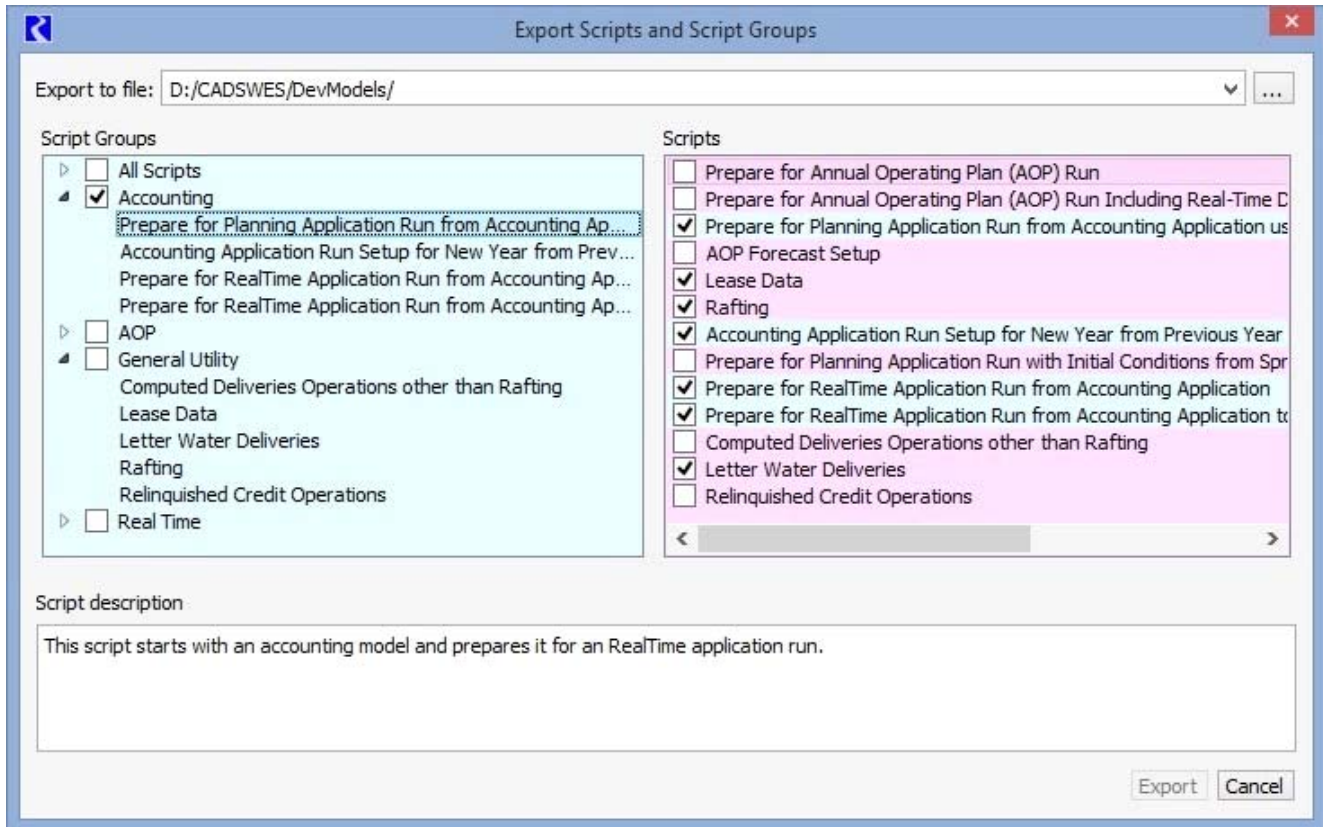


First, specify a file for export. Either select from the pull down menu, type in a file name or use the ellipsis button to choose a file on the system.

Then specify the scripts or groups to export.

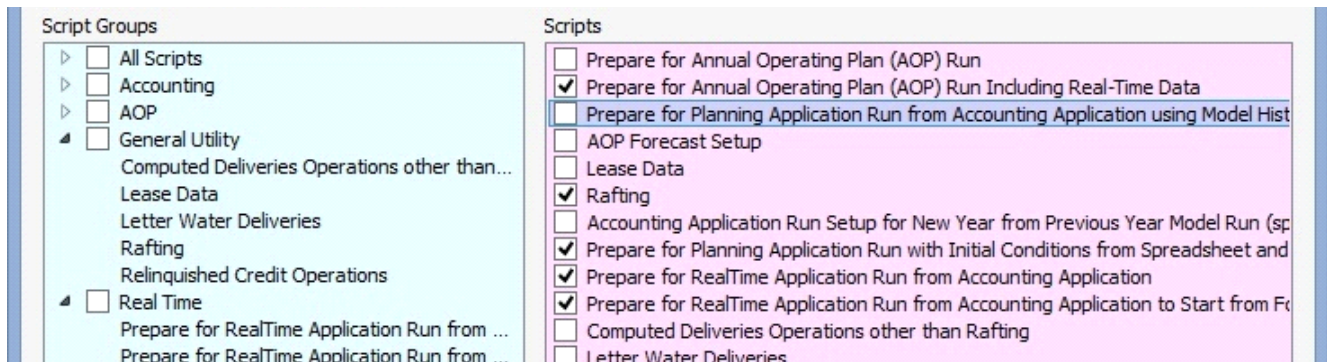
The dialog contains two sections, one on the left, listing Script Groups and one on the right, listing all Scripts. The lower panel shows the description of the highlighted (not checked) script.

To export one or more Script Groups and the scripts referenced by the group, select the checkboxes in the left panel. All constituent scripts will be exported. Use the tree view arrows to see which scripts are part of the group. Also, as you select a group, notice that the referenced scripts will also be checked and the background color will change in the Scripts panel on the right, as shown in the next screenshot. Note you cannot uncheck scripts that have been selected for export that are part of a group. The following screenshot shows that 1 group containing 4 scripts (blue) will be exported as well as 3 additional scripts (pink).



Note: To export all of the scripts in the model, simply click on the **All Scripts** group.

To select one or more scripts to export that are not part of a group, select them from the right panel. The following screenshot shows that 5 individual scripts will be exported:

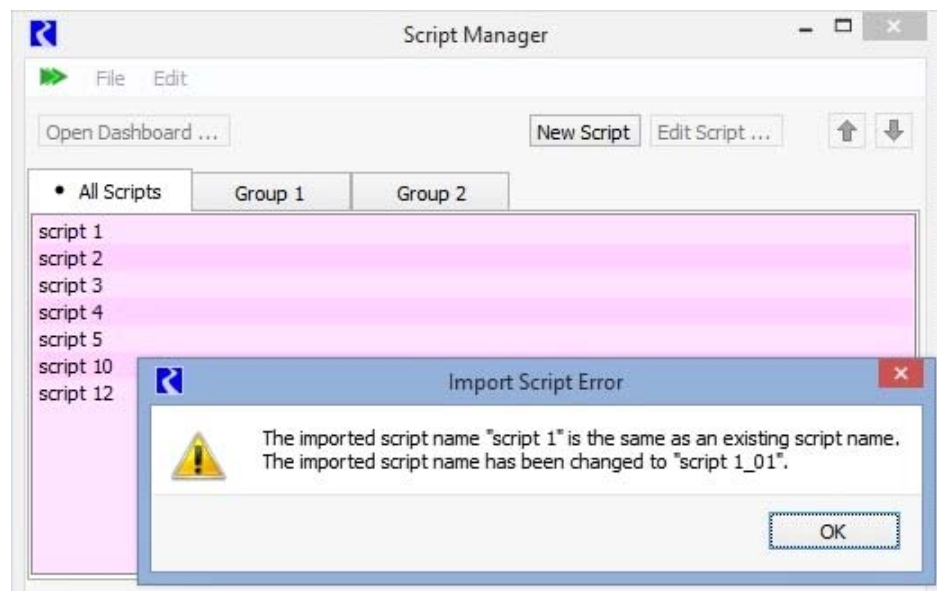


Once you have checked the desired groups/scripts, make sure to specify a file name at the top of the dialog. Then click **Export** to export the file.

2.4.2 Import Scripts

Use the **File** ➤ **Import Script** to import previously exported scripts. Choose the file name and click **Open**.

If there is a name duplication between a Script or Script Group being imported and an already existing Script or Script Group, the name being imported is automatically changed by appending "_nn" to the existing name, where nn is a two digit integer that is increased from 01 until a unique name is encountered. This scheme preserves imported-item name information without requiring detailed renaming actions during the import operation. You are notified that automatic renaming has occurred, in case you want to edit the names of the affected items afterwards.



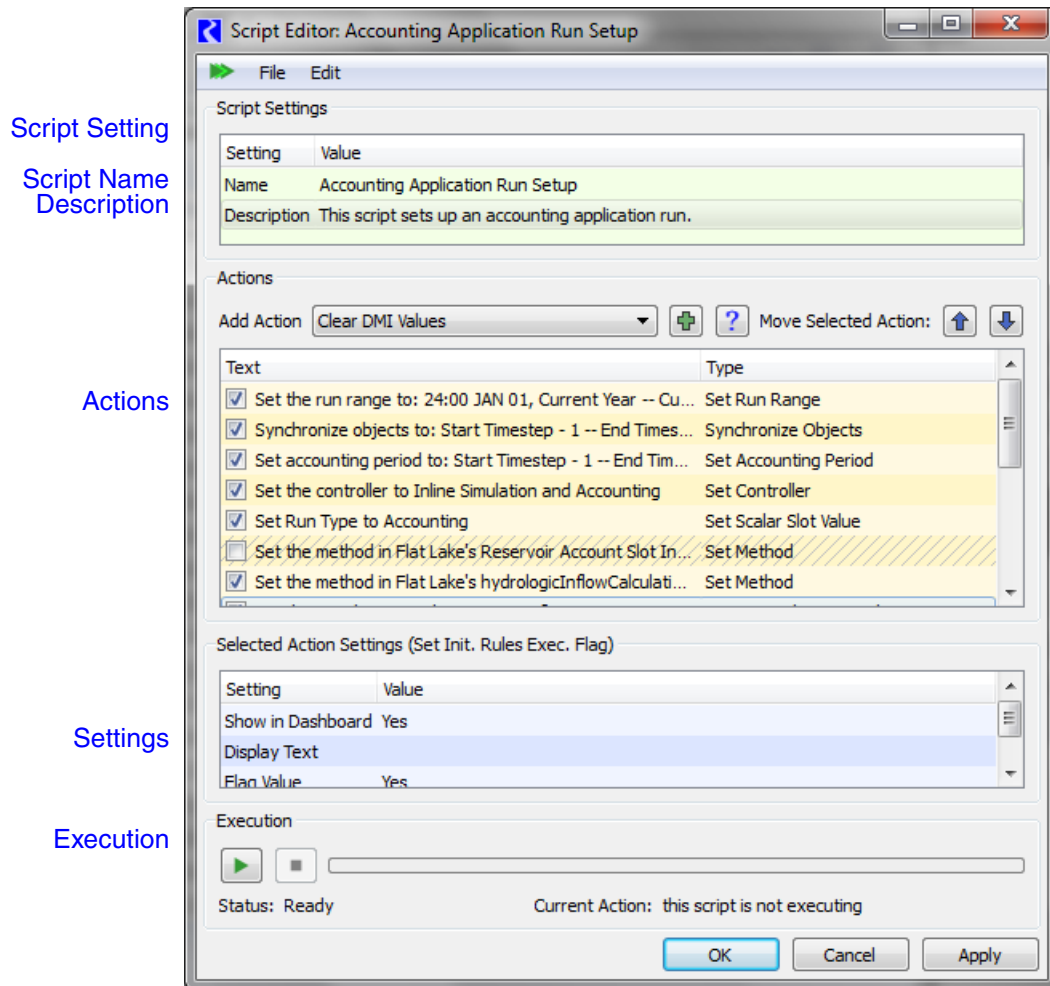
3. Editing a Script

The Script Editor is where you define the “**Actions**” that the script performs. In addition, you define how the script will appear in the **Script Dashboard** and what values can be edited by the script user. To open the **Script Editor**, select a script in the **Script Manager** and click **Edit...** The **Script Editor** has the following areas as shown in the following screenshot:

- **Script Settings:** This set of items applies to the entire script and includes the following configuration:

- **Script Name:** The unique name of the script appears here and in the list of scripts in the Script Manager.
- **Description Editor:** Enter a description, if desired, that will appear in the Script Manager.

- **Actions** panel: This is an ordered sequence of actions, each of which has one of the defined action types. Each item has either a default or user defined label and its type. E.g., Text: “Set the run range to:...” Type: “Set Run Range”. Each action can be disabled (or enabled) using the checkbox.
- **Selected Action Settings** panel: Each action type has two or more associated parameters, each of which has an associated setting. For example, an action of type “**Set Method**” has two standard parameters, **Show in Manager** and **Display Text**, and three specific parameters, **Object Name**, **Category**, and **Method**.

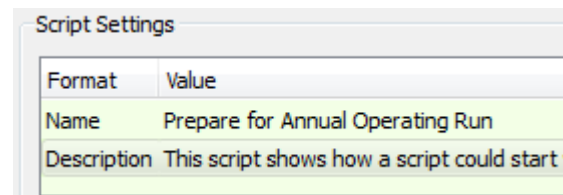


- **Execution** panel: When creating and debugging your script, it may be more convenient to run the script from here than opening the Script Dashboard. Use the Start button to execute the script. The ability to run the script from the Editor is strictly for convenience while creating and editing the script. The interface and feedback for running a script is much better on the Script Dashboard described [HERE \(Section 4\)](#).


3.1 Using the Script Editor

This section describes how to use the Script Editor to define the script. This assumes you have created a new Script from the Script Manager. The Script Editor opens automatically for new scripts or click Edit to open an existing script.

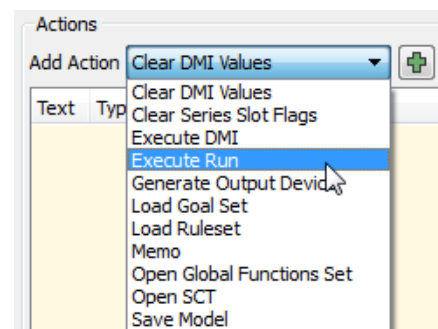
1. Enter a meaningful name in the Name field:
2. Enter a description if desired.



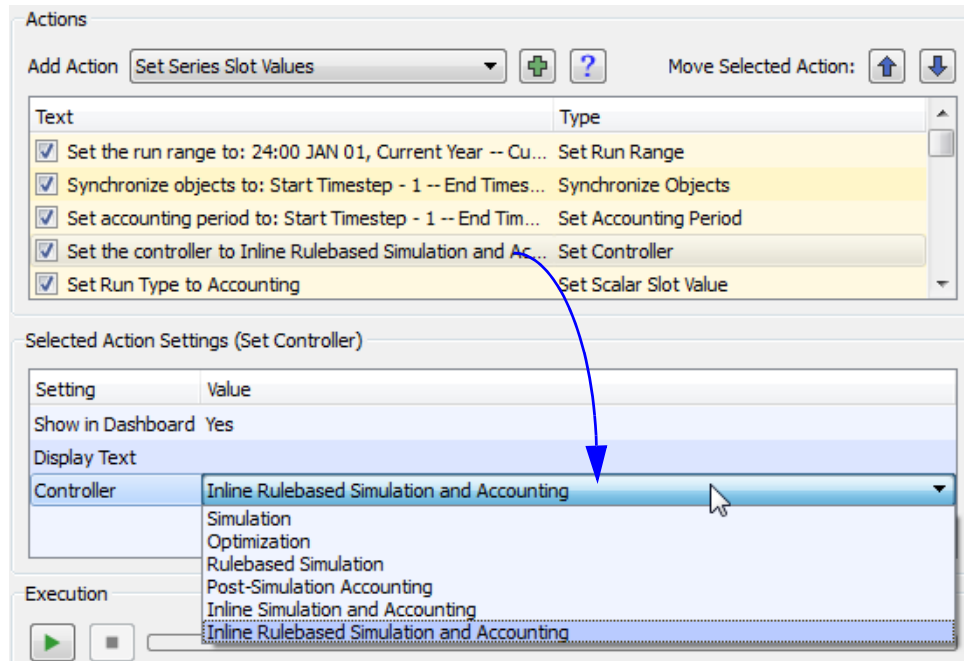
3. Add an Action to the script. A full list of the available actions is provided [HERE \(Section 3.2\)](#). Click the question mark icon

 for a quick description of each action. Use the Add Action pulldown and select the desired action. When you select the action it will automatically add it to the script and select it.

4. Configure that action. With the action selected, the Settings panel shows the available parameters. For example, in the





following screenshot, the **Set Controller** action is selected, so now the controller can be chosen from the list in the settings panel.



Each action has two or more settings that can be configured. For many of the settings, you provide a numeric value but can also specify that it is editable in the Script Manager. For example, you may use the Set Scalar Slot Value action to set a model trigger. You can specify that the value should default to 0 in the script but allow the user to override the default and use a slider bar in the Script Manager to change the value. This type of configuration is described in detail [HERE \(Section 3.5\)](#).

5. Repeat Steps 3 and 4 until you've fully defined the script.

6. Use the arrows **Move Selected Action:**   to rearrange the actions as necessary. They will execute in order from top to bottom.

7. Once you have the script defined, consider what text to be shown on the Script Manager. Use the **Show in Manager** and **Display Text**, to modify whether the setting is shown and if so, the text that is displayed, respectively. This is described in more detail [HERE \(Section 3.3\)](#). In addition, you can disable actions using the check boxes. This is enabled/disabled setting is shown on the dashboard but can be re-enabled there too. This is described [HERE \(Section 3.3\)](#).

8. Click OK to apply the changes and close the dialog.

3.2 Action Types - Descriptions

The following table describes the types of actions. Within the Script Editor, use the ? icon for a quick reference of the actions. Each action type also has a link to additional information on its settings.

Action Type	Description	Link
Clear DMI Values	Clear the values set by a DMI (by using the DMI invocation manager functionality)	Section 3.3.1
Clear Scalar Slot Values	Clear the values on a set of Scalar Slots (i.e. set them to NaN).	Section 3.3.2
Clear Table Slot Values	Clear certain values on a set of Table slots (i.e. set them to Nan).	Section 3.3.3
Configure MRM Index Sequential	For the specified MRM configuration, modify the configuration in terms of Index Sequential.	Section 3.3.4
Configure MRM Input DMI	For the specified MRM configuration, modify the configuration in terms of Input DMIs, particularly the repeat count.	Section 3.3.5
Configure MRM Output	For the specified MRM configuration, modify the configuration in terms of the Output.	Section 3.3.6
Create Slot Cache	Create a slot cache of workspace series slot values.	Section 3.3.7
Create Snapshot	Create a Snapshot of the specified slots.	Section 3.3.8
Enable Dispatching	Enable or disable dispatching of the specified objects.	Section 3.3.9
Enable MRM Distributed Runs	For the specified MRM configuration, specify whether to distribute concurrent runs to multiple processors on the same machine.	Section 3.3.10
Enable RPL Item	Enable or disable a RPL item (policy group, rule, method, or goal)	Section 3.3.11
Evaluate Expression Slots	Evaluate a set of expression slots.	Section 3.3.12
Execute DMI	Invoke a DMI or DMI group.	Section 3.3.13
Execute MRM Run	Execute the specified MRM configuration.	Section 3.3.14
Execute Run	Run the model.	Section 3.3.15
Execute Script	Execute a script from within a script.	Section 3.3.16
Generate Output Device	Generate the specified Output Device. This could be a file based device like a Model Report or a graphical device like a Plot Page.	Section 3.3.17
Global Time Scroll	Scroll time and series displays to the specified symbolic date/time.	Section 3.3.18
Load Goal Set	Open and load a goal set (for Optimization runs).	Section 3.3.19

Action Type	Description	Link
Load Ruleset	Open and load a ruleset (for Rulebased Simulation runs)	Section 3.3.20
Memo	Pause script execution and optionally open a confirmation dialog with your user specified message. While script execution is paused, you can interact with RiverWare or other applications in ways not directly supported by scripts. Click the Script start button to resume the script execution.	Section 3.3.21
Open Global Functions Set	Open a global function set.	Section 3.3.22
Open Object	Open the specified objects.	Section 3.3.23
Open SCT	Open an SCT with the specified filename.	Section 3.3.24
Open Slots	Open the specified slots.	Section 3.3.25
Remove RPL Set	Remove a selected RPL set from the model. An RBS Ruleset or Optimization Goal set is unloaded and closed, a Global Function Set is closed, and the Initialization Rules Set is cleared.	Section 3.3.26
Reorder RPL Set	Reorder the items (rules, goals, statements) in a RPL set according to priority or index defined on the specified table slot.	Section 3.3.27
Replace Initialization Rules Set from File	Replace the existing Initialization Rules Set from a file.	Section 3.3.28
Save Model	Save the model to a file.	Section 3.3.29
Set Account Method	Set the selected method in one of an account's method categories.	Section 3.3.30
Set Accounting Period	Set the time range of the accounting system (i.e., the Begin Accounting Period and End Accounting Period dates).	Section 3.3.31
Set Controller	Set the current controller.	Section 3.3.32
Set Dataset File	Set the DSS file for a DSS dataset, or the Excel workbook for an Excel dataset.	Section 3.3.33
Set Excel Dataset Run Name	For the specified Database DMI Excel Dataset, set the run name type and/or specify a new single run name.	Section 3.3.34
Set Init. Rules Exec. Flag	Set the "Execute Initialization Rules" run control flag. This flag controls whether or not the initialization rules are executed as part of each run.	Section 3.3.35

Action Type	Description	Link
Set Method	Set the selected method in the specified category for a set of objects.	Section 3.3.36
Set MRM Descriptor	For the specified MRM configuration, set the specified keyword, value pair MRM Descriptor.	Section 3.3.37
Set MRM Ruleset	In a given MRM configuration, set a new file path to a ruleset.	Section 3.3.38
Set MRM Run Range	Set the time range of the run (i.e. the Run Start and End dates) for the specified MRM configuration.	Section 3.3.39
Set Run Range	Set the time range of the run (i.e. the Run Start and End dates).	Section 3.3.40
Set Run Timestep	Set the timestep size of the run (E.g 1 hr, Daily, Monthly, yearly). Options are included to specify how to synchronize and optionally aggregate data.	Section 3.3.41
Set Scalar Slot Value	Set one or more Scalar Slots' value.	Section 3.3.42
Set Series Slot Flags	Set the specified flag (input or output) on a set of series slots within the specified time range.	Section 3.3.43
Set Series Slot Values	Set Series Slot's values within a time range.	Section 3.3.44
Set Table Slot Value	Set a single Table Slot's value at the specified row and column.	Section 3.3.45
Synchronize Objects	Set the time range for the specified objects.	Section 3.3.46
Synchronize Slots	Set the time range for the specified slots.	Section 3.3.47

3.3 Action Types - Settings

An action is controlled by user settings. Actions of all types have the following settings:

- **Show In Manager:** This is a Yes/No value which controls whether or not that action is listed in the Script Manager's "Summary & Controls" panel.
- **Display Text:** This brief text identifies the action. This text is, for example, shown for diagnostic messages and the Script Manager's "Summary & Controls" panel. If empty, default text will be automatically generated by RiverWare.
- **Enabled/Disabled:** Each action has a check box next to it which determines whether it is enabled/disabled in the script editor. This setting is also used to indicate whether the action starts out as enabled or disabled in the script dashboard, although it can be overridden in the dashboard.

Text	Type
<input type="checkbox"/> Set the method in Flat Lake's Reservoir Account Slot In...	Set Method
<input checked="" type="checkbox"/> Set the method in Flat Lake's hydrologicInflowCalculati...	Set Method

The following subsections list settings which are specific to each type of action:

3.3.1 Clear DMI Values

Action Type:	Clear DMI Values	
Description:	Clear the values set by a DMI (by using the DMI invocation manager functionality)	
Setting	Type	Notes
DMI Name	Text	Enter the DMI name or choose the DMI using the menu.

3.3.2 Clear Scalar Slot Values

Action Type:	Clear Scalar Slot Values	
Description:	Clear the values on a set of Scalar Slots (i.e. set them to NaN).	
Setting	Type	Notes
Slots	Slot Selection	Enter or choose one or more scalar slots for which you wish to clear the values.

3.3.3 Clear Table Slot Values

Action Type:	Clear Table Slot Values	
Description:	Clear certain values on a set of Table slots (i.e. set them to Nan).	
Setting	Type	Notes
Slots	Slot Selection	Enter or choose one or more table slots. The values in these slots will be cleared.
Row	Text	Specify the row as either the row number (zero based) or the row heading
Column	Text	Specify the column as either the column number (zero based) or column heading

3.3.4 Configure MRM Index Sequential

Action Type:	Configure MRM Index Sequential	
Description:	For the specified MRM configuration, modify the configuration in terms of Index Sequential. This is shown on the Input tab in the MRM configuration. Click HERE (MRM.pdf, Section 4.5.3) for more information.	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller
Number of Runs	Integer	Specify the Number of Runs
Initial Offset	Integer	Specify the Initial Offset
Interval	Integer	Specify the Interval

3.3.5 Configure MRM Input DMI

Action Type:	Configure MRM Input DMI	
Description:	For the specified MRM configuration, modify the configuration in terms of Input DMIs, particularly the repeat count. This is shown on the Input tab in the MRM configuration. Click HERE (MRM.pdf, Section 4.5) for more information.	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller.
DMI Name	Text	Choose the Input DMI to configure. This should already be selected in the MRM configuration.
Repeat Count	Integer	Specify the Repeat Count.

3.3.6 Configure MRM Output

Action Type:	Configure MRM Output	
Description:	For the specified MRM configuration, modify the configuration in terms of the Output. This is shown on the Output tab in the MRM configuration. Click HERE (MRM.pdf, Section 4.8) for more information.	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller.
Control File	File Chooser	Enter the file path. Click HERE (Filename Information) for details.
Generate CSV Files	Yes/No	Specify whether or not to generate CSV output
Generate NetCDF Files	Yes/No	Specify whether or not to generate NetCDF output
Allow Control File Editing	Yes/No	Specify if you would like the control file to be editable on the dashboard.

3.3.7 Create Slot Cache

Action Type:	Create a cache of slot values	
Description:	Creates a slot cache that contains the current values of all series slots on the workspace, in the range of the current controller. The cache is described HERE (Workspace.pdf, Section 5.9) . Note, the slot cache is under development. Please contact riverware-support@colorado.edu for more information and the current status of this feature.	
Setting	Type	Notes
None		

3.3.8 Create Snapshot

Action Type:	Create Snapshot	
Description:	Create a Snapshot of the specified slots.	
Setting	Type	Notes
Slots	Slot Selection	Enter or choose one or more slots for which you wish to take a snapshot.
Snapshot Name	Text	Specify the name of the snapshot object to create.
Replace Existing Snapshot?	Yes/No	Choose to replace a snapshot of the same name. If No, then a unique name for the snapshot will be created.

3.3.9 Enable Dispatching

Action Type:	Enable Dispatching	
Description:	For the specified objects, enable or disable the dispatch method execution.	
Setting	Type	Notes
Objects	Object Selection	Choose the desired objects using the object selector.
Enable or Disable?	Enable Dispatching / Disable Dispatching	Specify Enable to run in distributed mode. Specify Disable to run the concurrent runs on a single processor.

3.3.10 Enable MRM Distributed Runs

Action Type:	Enable MRM Distributed Runs	
Description:	For the specified MRM configuration, specify whether to distribute concurrent runs to multiple processors on the same machine. For more information on distributed MRM, click HERE (MRM.pdf, Section 6) .	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller.
Enable or Disable?	Enable / Disable	Specify Enable to run in distributed mode. Specify Disable to run the concurrent runs on a single processor.

3.3.11 Enable RPL Item

Action Type:	Enable RPL Item	
Description:	Enable or disable a RPL item (policy group, rule, method, or goal)	
Setting	Type	Notes
Set	Single Selection	Choose the set to which the RPL item belongs.
Item	Single Selection	Use the RPL item chooser to select the item.
Enable or Disable?	Yes/No	Specify Yes to Enable or No to disable the specified item.

3.3.12 Evaluate Expression Slots

Action Type:	Evaluate Expression Slots	
Description:	Evaluate a set of expression slots.	
Setting	Type	Notes
Slots	Slot Selection	Choose the slots using the selector.

3.3.13 Execute DMI

Action Type:	Execute DMI	
Description:	Invoke a DMI or DMI group.	
Setting	Type	Notes
DMI Name	Text	Enter the DMI name or choose the DMI using the menu.

3.3.14 Execute MRM Run

Action Type:	Execute MRM Run	
Description:	Execute the specified MRM configuration.	
Setting	Type	Notes
Configuration	Text	Enter the name of an MRM configuration you wish to run.

3.3.15 Execute Run

Action Type:	Execute Run	
Description:	Run the model.	
Setting	Type	Notes

3.3.16 Execute Script

Action Type:	Execute Script	
Description:	Execute a script from within this script. Note, the script called by this action cannot have additional Execute Script actions. Rephrased, a script cannot call a script that calls another script. Only one level of a script executing a script is allowed. Also, a script cannot call itself. Note, within the dashboard, only the name of the executed script or the display text is shown. It is currently not possible to show the called actions.	
Setting	Type	Notes
Script Name	Text	Type the script name or choose the desired single script from the script selector.

3.3.17 Generate Output Device

Action Type:	Generate Output Device	
Description:	Generate the specified Output Device. This could be a file based device like a Model Report or a graphical device like a Plot Page.	
Setting	Type	Notes
Device Name	Text	Enter or choose the name of a output device (plot, file, report, chart)

3.3.18 Global Time Scroll

Action Type:	Global Time Scroll	
Description:	Scroll time and series displays to the specified symbolic date/time.	
Setting	Type	Notes
Scroll to DateTime	Datetime	Click HERE (Section 3.4.1) for details.
Allow Editing	Selection	Yes indicates that users should be allowed to override the start date in the Dashboard.

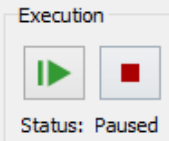
3.3.19 Load Goal Set

Action Type:	Load Goal Set	
Description:	Open and load a goal set (for Optimization runs).	
Setting	Type	Notes
File name	Text	Enter the file path. Click HERE (Filename Information) for details.
Confirm Replacement	Yes/No	Yes indicates that if the specified set is already open, a dialog should be presented to confirm replacement of the existing set.
Show Dialog	Yes/No	When this setting is Yes , the RPL set dialog is shown when the action is executed. Otherwise, the set is loaded into the model, but not shown.

3.3.20 Load Ruleset

Action Type:	Load Ruleset	
Description:	Open and load a ruleset (for Rulebased Simulation runs).	
Setting	Type	Notes
File name	Text	Enter the file path. Click HERE (Filename Information) for details.
Confirm Replacement	Yes/No	Yes indicates that if the specified set is already open, a dialog should be presented to confirm replacement of the existing set.
Show Dialog	Yes/No	When this setting is Yes , the RPL set dialog is shown when the action is executed. Otherwise, the set is loaded into the model, but not shown.

3.3.21 Memo

Action Type:	Memo	
Description:	Pause script execution and optionally open a confirmation dialog with your user specified message. While script execution is paused, you can interact with RiverWare or other applications in ways not directly supported by scripts. Click the Script continue button to resume the script execution.	
Setting	Type	Notes
Explanation	Multi-line text	Enter the desired text. This will optionally be displayed in the memo dialog and or the Dashboard dialog along with the Display Text.
Pause Execution	Yes/No	Yes indicates that script execution will pause when the memo is reached. Click the continue button to resume the Script execution. 
Show Memo Dialog	Yes/No	Yes indicates that memo execution will open a dialog which presents the memo display and explanation texts.
Show Explanation in the Dashboard	Yes/No	Yes indicates that the explanation text will be displayed with the display text in the Dashboard.

3.3.22 Open Global Functions Set

Action Type:	Open Global Functions Set	
Description:	Open a global function set.	
Setting	Type	Notes
File name	Text	Enter the file path. Click HERE (Filename Information) for details.
Confirm Replacement	Yes/No	Yes indicates that if the specified set is already open, a dialog should be presented to confirm replacement of the existing set.
Show Dialog	Yes/No	When this setting is Yes , the RPL set dialog is shown when the action is executed. Otherwise, the set is opened into the model, but not shown.

3.3.23 Open Objects

Action Type:	Open Objects	
Description:	Open the specified objects' dialogs.	
Setting	Type	Notes
Objects	Object Selection	Choose the objects to open.

3.3.24 Open SCT

Action Type:	Open SCT	
Description:	Open an SCT with the specified filename.	
Setting	Type	Notes
File Name	Text	Enter the file path. Click HERE (Filename Information) for details.

3.3.25 Open Slots

Action Type:	Open Slots	
Description:	Open the specified slots.	
Setting	Type	Notes
Slots	Slot Selection	Choose the slots using the selector.

3.3.26 Remove RPL Set

Action Type:	Remove RPL Set	
Description:	Remove a selected RPL set from the model. An RBS Ruleset or Optimization Goal set is unloaded and closed, a Global Function Set is closed, or the Initialization Rules Set is cleared. Note, if you have any of these sets saved in the model file and you remove them using this action, any changes will be lost! This action should only be used if you have the set saved to a file and wish to remove it from the model and reopen it from the file. Use with caution!	
Setting	Type	Notes
Set	Single Selection	Choose the desired RPL set.
Confirm Removal	Yes/No	Yes indicates that a dialog should be presented to confirm removal of the set.

3.3.27 Reorder RPL Set

Action Type:	Reorder RPL Set	
Description:	Reorder the items (rules, goals, statements) in a RPL set according to priority or index defined on the specified table slot.	
Setting	Type	Notes
Set	Single Selection	Choose the desired RPL set.
Order Slot	Single Slot Selection	Choose the table slot which specifies the new RPL set ordering. Click HERE (Section 3.4.3) for more information.

3.3.28 Replace Initialization Rules Set from File

Action Type:	Replace Initialization Rules Set from File	
Description:	Replace the existing Initialization Rules Set from a file. Any changes made to the Initialization Rules in the model will be lost. Use with caution!	
Setting	Type	Notes
File name	Text	Enter the file path. Click HERE (Section 3.4.2) for details.
Confirm Replacement	Yes/No	Yes indicates that a dialog should be presented to confirm replacement of the existing Initialization Rules Set.
Show Dialog	Yes/No	When this setting is Yes , the RPL set dialog is shown when the action is executed. Otherwise, the set is replaced in the model, but not shown.

3.3.29 Save Model

Action Type:	Save Model	
Description:	Save the model to a file.	
Setting	Type	Notes
File Name	Text	Enter the file path. Click HERE (Section 3.4.2) for details.
Include Output Values	Yes/No	Yes indicates output values will be saved.
Output Values Precision	Integer	Indicates the precision to use for output values.
Confirm Overwrite	Yes/No	Yes requires interactive confirmation when saving the model to a pre-existing file.

3.3.30 Set Account Method

Action Type:	Set Account Method	
Description:	Set the selected method in one of an account's method categories.	
Setting	Type	Notes
Account Name	Text	Choose the account using the selector

Action Type:	Set Account Method	
Description:	Set the selected method in one of an account's method categories.	
Setting	Type	Notes
Category	Text	Choose the category on the account
Method	Text	Choose the desired method

3.3.31 Set Accounting Period

Action Type:	Set Accounting Period	
Description:	Set the time range of the accounting system (i.e., the Begin Accounting Period and End Accounting Period dates).	
Setting	Type	Notes
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.

3.3.32 Set Controller

Action Type:	Set Controller	
Description:	Set the current controller.	
Setting	Type	Notes
Controller	Selection	Choose the controller from the list

3.3.33 Set Dataset File

Action Type:	Set Dataset File	
Description:	Set the DSS file for a specified DSS Dataset or the Excel workbook for a specified Excel Dataset.	
Setting	Type	Notes
Dataset	Text	Enter or choose the name of a DSS Dataset or an Excel Dataset defined in the Dataset Manager.

Setting	Type	Notes
File Name	Text	Enter or choose the DSS file or Excel workbook.
Allow File Editing	Selection	Yes means the file can be entered or chosen in the Dashboard. No means that the file cannot be changed in the Dashboard.

3.3.34 Set Excel Dataset Run Name

Action Type:	Set Excel Dataset Run Name	
Description:	For the specified Database DMI Excel Dataset, set the run name type and/or specify a new single run name.	
Setting	Type	Notes
Excel Dataset	Text	Enter or choose the name of an Excel Dataset defined in the Dataset Manager. For more information on Excel Datasets, click HERE (DMI.pdf, Section 5.3.3) .
Run Name Type	Selection	Choose one of the available Run Name Types either: <ul style="list-style-type: none"> • Single Run Name • Run with MRM Number (i.e. Run0, Run1, ...) • Trace with MRM Trace Number (i.e. Trace1, Trace2,...)
Single Run Name	Text	This setting is shown when the above setting is set to Single Run Name. Enter a new Single Run Name or choose one from the list as specified HERE (DMI.pdf) . In the Script Dashboard you can enter a new Single Run Name or choose one from the same list.

3.3.35 Set Init. Rules Exec. Flag

Action Type:	Set Init. Rules Exec. Flag	
Description:	Set the “Execute Initialization Rules” run control flag. This flag controls whether or not the initialization rules are executed as part of each run.	
Setting	Type	Notes
Flag Value	Yes/No	Yes = execute initialization rules.

3.3.36 Set Method

Action Type:	Set Method	
Description:	Set the selected method in the specified category for a set of objects.	
Setting	Type	Notes
Object Name	Text	Choose one or more the objects using the selector
Category	Text	Choose the category on the object. The list shown is for the first object.
Method	Text	Choose the desired method. If the category or method is not possible on the object, an error will be issued.

3.3.37 Set MRM Descriptor

Action Type:	Set MRM Descriptor	
Description:	In a given MRM configuration, set the specified keyword, value pair MRM Descriptor. The descriptors are shown on the Description tab of the MRM configuration. For more information, click HERE (MRM.pdf, Section 4.2) .	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller
Keyword	Text	Specify the Keyword. If the Keyword does not exist in the configuration, a new one is created.
Value	Text	Specify the desired Value to use with the Keyword.

3.3.38 Set MRM Ruleset

Action Type:	Set MRM Ruleset	
Description:	In a given MRM configuration, set a new file path to a ruleset. The ruleset is shown on the Policy tab of the MRM configuration. For more information, click HERE (MRM.pdf, Section 4.4) .	

Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller
Ruleset	Integer	Specify which of the rulesets you wish to change. The default is the first ruleset, 1.
File Name	Text	Enter the file path. Click HERE (Section 3.4.2) for details.

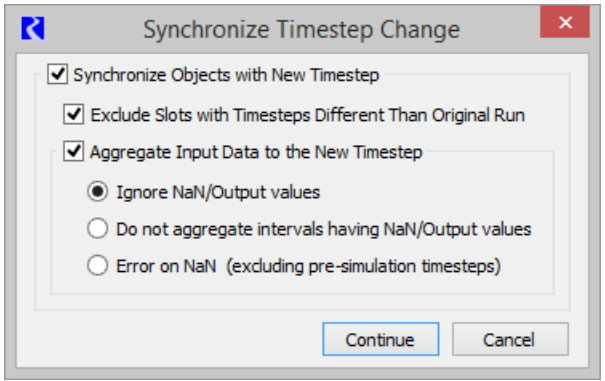
3.3.39 Set MRM Run Range

Action Type:	Set MRM Run Range	
Description:	Set the time range of the run (i.e. the Run Start and End dates) for the specified MRM configuration. The run range is shown on the Run Parameters tab of the MRM configuration. For more information, click HERE (MRM.pdf, Section 4.3.1) .	
Setting	Type	Notes
MRM Configuration	Text	Enter or choose the name of an MRM configuration defined in the MRM Run Controller
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.
Allow Start Date Editing	Yes/No	Yes indicates that users should be allowed to override the start date in the Dashboard.
Allow End Date Editing	Yes/No	Yes indicates that users should be allowed to override the end date in the Dashboard.

3.3.40 Set Run Range

Action Type:	Set Run Range	
Description:	Set the time range of the run (i.e., the Run Start and End dates).	
Setting	Type	Notes
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.
Allow Start Date Editing	Yes/No	Yes indicates that users should be allowed to override the start date in the Dashboard.
Allow End Date Editing	Yes/No	Yes indicates that users should be allowed to override the end date in the Dashboard.

3.3.41 Set Run Timestep

Action Type:	Set Run Timestep	
Description:	<p>Set the run timestep size. This action is analogous to changing the run control timestep size. The settings in the action are analogous to the options presented in the screenshot shown and described HERE (RunControl.pdf, Section 7.1).</p>	
		
Setting	Type	Notes
Timestep	Selection	Choose from 1 Hour, 6 Hour, 12 Hour, Daily, Monthly, or Yearly.
Synchronize Objects with New Timestep	Yes/No	Should objects be synchronized to the new timestep?
Exclude Slots with Timesteps Different Than Original Run	Yes/No	Should slots with a timestep that is different than the original run be synchronized with the new timestep?
Aggregate Input Data to the New Timestep	Yes/No	When changing to a larger timestep (monthly or yearly), should Input values be aggregated?
Aggregate NaN Handling	Selection	If aggregating, how should NaN and Output values in input slots be handled? More information is available HERE (RunControl.pdf, Section 7.1) on aggregation.

3.3.42 Set Scalar Slot Value

Action Type:	Set Scalar Slot Value	
Description:	Set one or more Scalar Slots' value.	
Setting	Type	Notes
Slots	Slot Selection	Choose the scalar slots using the selector
Value	Numeric (slot value)	Specify the value to set. This value can remain or be set to NaN.
Allow Editing	Selection	No indicates that the value can not be changed in the Dashboard, Yes: Editor indicates that it can be changed using a line editor; Yes: Radio Buttons indicate that a set of radio buttons should be presented in the Dashboard to override the value; and Yes: Slider indicates that a slider should be presented to allow changes to the value.
Minimum Edit Value	Numeric (slot value)	Specify the minimum value that is allowed in the Dashboard (applies to Slider only).
Maximum Edit Value	Numeric (slot value)	Specify the maximum value that is allowed in the Dashboard (applies to Slider only)
Encoding Table Slot Name	Slot Selection	The table slot row labels and values establish a textual encoding of values. Applies only to Radio Button display. Click HERE (Section 3.5) for details.
Show Current Value	Yes/No	When Allow Editing is Yes, then this setting allows you to show the current value for the scalar slot on the Dashboard. This only works when one scalar slot is specified.

3.3.43 Set Series Slot Flags

Action Type:	Set Series Slot Flags	
Description:	Set the specified flag (input or output) on a set of series slots within the specified time range.	
Setting	Type	Notes
Slots	Slot Selection	Enter or choose one or more series slots. The flags in these slots will be set to the specified value.
Column	Text	The name of the column of a multi-column series slot. If not specified, the first column is used.

Setting	Type	Notes
Start Date	Datetime	The first timestep for which you wish to set the flag. Click HERE (Section 3.4.1) for details.
End Date	Datetime	The last timestep for which you wish to set the flag. Click HERE (Section 3.4.1) for details.
Flag	Selection	The flag to set on each value in the range.

3.3.44 Set Series Slot Values

Action Type:	Set Series Slot Values	
Description:	Set Series Slot's values within a time range.	
Setting	Type	Notes
Slots	Slot Selection	Choose the series slot using the selector
Value	Numeric (slot value)	Specify the value to set at each timestep specified. This value can remain or be set to NaN.
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.
Allow Editing	Selection	No indicates that the value can not be changed in the Dashboard, Yes: Editor indicates that it can be changed using a line editor; Yes: Radio Buttons indicate that a set of radio buttons should be presented in the Dashboard to override the value; and Yes: Slider indicates that a slider should be presented to allow changes to the value.
Minimum Edit Value	Numeric (slot value)	Specify the minimum value that is allowed in the Dashboard (applies to Slider only).
Maximum Edit Value	Numeric (slot value)	Specify the maximum value that is allowed in the Dashboard (applies to Slider only)
Encoding Table Slot Name	Slot Selection	The table slot row labels and values establish a textual encoding of values. Applies to Radio Buttons only. Click HERE (Section 3.5) for details.

3.3.45 Set Table Slot Value

Action Type:	Set Table Slot Value	
Description:	Set a single Table Slot's value at the specified row and column.	
Setting	Type	Notes
Slots	Slot Selection	Choose the table slot using the selector
Row	Text	Specify the row as either the row number (zero based) or the row heading
Column	Text	Specify the column as either the column number (zero based) or column heading
Value	Numeric (slot value)	Specify the value to set. This value can remain or be set to NaN.
Allow Editing	Selection	No indicates that the value can not be changed in the Dashboard, Yes: Editor indicates that it can be changed using a line editor; Yes: Radio Buttons indicate that a set of radio buttons should be presented in the Dashboard to override the value; and Yes: Slider indicates that a slider should be presented to allow changes to the value.
Minimum Edit Value	Numeric (slot value)	Specify the minimum value that is allowed in the Dashboard (applies to Slider only).
Maximum Edit Value	Numeric (slot value)	Specify the maximum value that is allowed in the Dashboard (applies to Slider only)
Encoding Table Slot Name	Slot Selection	The table slot row labels and values establish a textual encoding of values. Applies to Radio Buttons only. Click HERE (Section 3.5) for details.

3.3.46 Synchronize Objects

Action Type:	Synchronize Objects
Description:	Set the time range for the specified objects.

Setting	Type	Notes
Objects to Synchronize	Object Selection	Use the selector to choose the desired objects.
Exclude Slots with Non-run Timestep	Yes/No	Yes indicates that slots with different timesteps will be excluded from the synchronize action.
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.

3.3.47 Synchronize Slots

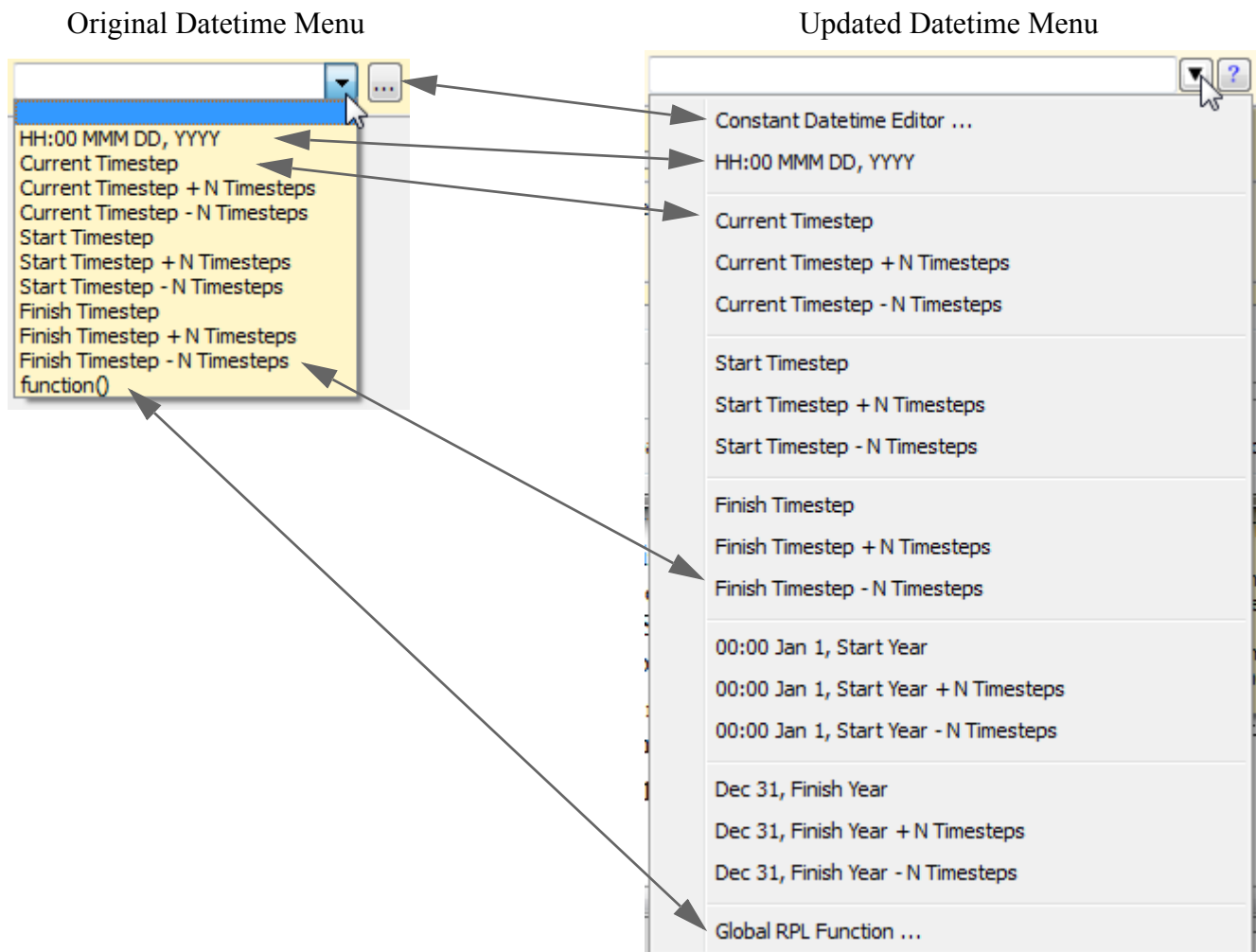
Action Type:	Synchronize Slots	
Description:	Set the time range for the specified slots.	
Setting	Type	Notes
Slots to Synchronize	Slot Selection	Use the selector to choose the desired slots.
Start Date	Datetime	Click HERE (Section 3.4.1) for details.
End Date	Datetime	Click HERE (Section 3.4.1) for details.

3.4 Setting Information

The following sections provide more information on certain settings or on settings that are shared by many actions that have additional controls.

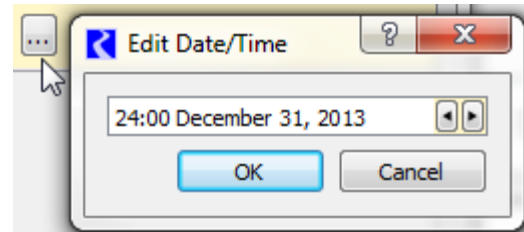
3.4.1 Datetime Information

Datetimes in a script can be specified either as absolute values or a symbolic values. There are two slightly different interfaces, but both have essentially the same functionality. Depending on the action and whether it is the editor or dashboard, one of the following interfaces will be used. Note, the current menu is being transitioned to the updated menu. Common functionality has been highlighted.



Following is additional information on each of these ways to specify the datetime.

- **Choose a Datetime:** Use the datetime **spinner** by clicking on the ellipsis button or choosing the **Constant Datetime Editor** option. This opens the chooser shown to the right. Note, this uses the model timestep size.
- **Type a Datetime:** Enter a date by typing. Use the HH:00 MMM DD, YYYY as a guide: Hour (H), Month (M), Day (D), Year (Y).
- **Specify the Datetime Symbolically:** Use one of the options shown and specify any of the pieces necessary like integers “N”, Hour (H), Month (M), Day (D), Year (Y). On the updated menu, click the Help icon for more information on the symbolical datetimes or click [HERE \(RPLTypesPalette.pdf, Section 1.3\)](#) for more information. Basically, any fully specified datetime can be used. Note, no @ or quotes “ ” are necessary when specifying the datetimes. In this context, “Current Timestep” means the machine/operating system time, rounded up to a controller timestep. So if you are running the script at noon on the 4th of July, 2014 in a daily model, “Current Timestep” would return 24:00 July 4th, 2014.
- **Use a Global Function:** To allow additional flexibility specifying datetimes, you can specify a RPL function from an opened Global Function Set, [HERE \(RPLUserInterface.pdf, Section 5\)](#). You can type in the name of the function (original menu) of the form `function()` or choose it using a selector (updated menu). This function must:
 - Return a fully specified DATETIME variable
 - Not have any arguments



Note: Datetimes stored on slots cannot be set to NaN as an override on the dashboard, but can be configured to be set to NaN from the Script Editor.

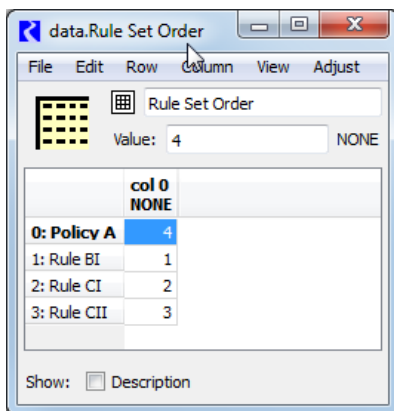
3.4.2 Filename Information

Filenames can be entered manually or chosen using the file chooser. You can specify files using environment variables using the \$VARIABLE syntax.

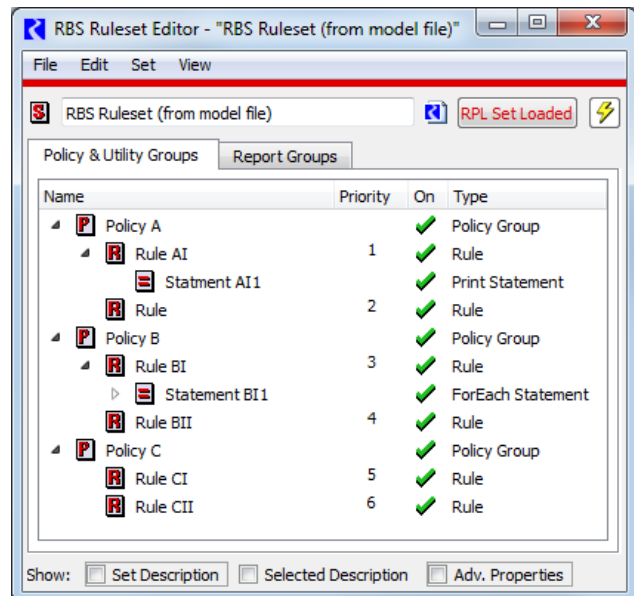
3.4.3 RPL Reorder Set action

This action allows you to reorder items (rules, goals, groups, or even statements within the specified set. The new order is specified on a table slot. Following is an example that shows the use of this action. Here is a screenshot of the ruleset before the script is executed. Note, that statements are shown using the View menu.

The specified table that describes the desired ordering is shown: The row labels must match the names of the items in the set.



A text description of this reordering is shown to the right.



```

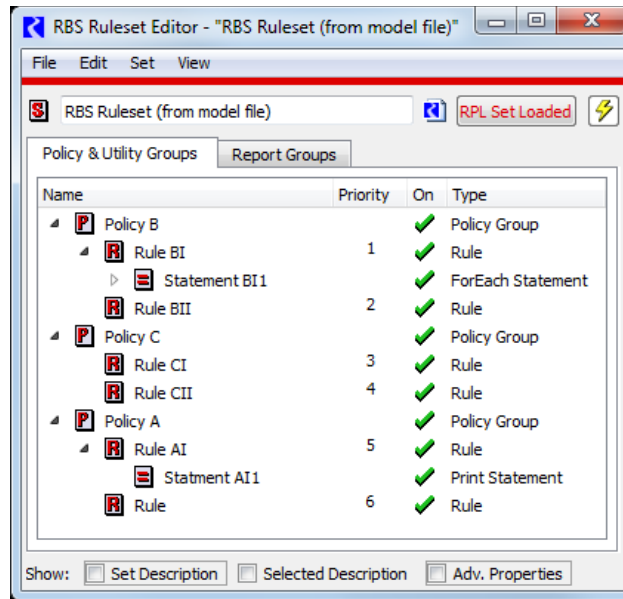
Before
  1. Policy A: desired order = 4, index in set = 2
  2. Rule BI: desired order = 1, index in set = 3
  3. Rule CI: desired order = 2, index in set = 5
  4. Rule CII: desired order = 3, index in set = 6

Reordering:
  Rule BI: leaving in place.
  Rule CI: leaving in place.
  Rule CII: leaving in place.
  Policy A: moving to after Rule CII

After
  1. Rule BI: desired order = 1, index in set = 1
  2. Rule CI: desired order = 2, index in set = 3
  3. Rule CII: desired order = 3, index in set = 4
  4. Policy A: desired order = 4, index in set = 6

```


The ruleset after reordering is shown below.



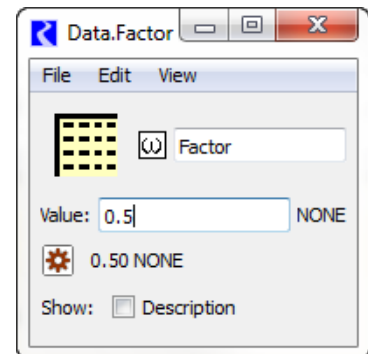
3.5 Configuring User Control on the Script Dashboard

For actions that set values in the model (Set Scalar Slot Value, Set Series Slot Values, Set Table Slot Value), you can either specify the value to set or give a default, but allow the user of the script to override that value. This section describes configuring the action so that the user can modify the value using either a value editor, radio buttons or a slider. These are controlled by the settings shown in the screenshot:

The following sections describe the three “Yes” cases. In each case, an example will be shown where a script is setting a scalar slot called Data.Factor to a value between 0.1 and 1.5. Perhaps this factor is then referenced by a rule to compute demands or inflows. For reference, shown is a screenshot of this scalar slot:

Allow Editing	Yes: Editor
Minimum Edit Value	No
Maximum Edit Value	Yes: Editor
Encoding TableSlot Name	Yes: Radio Buttons
	Yes: Slider

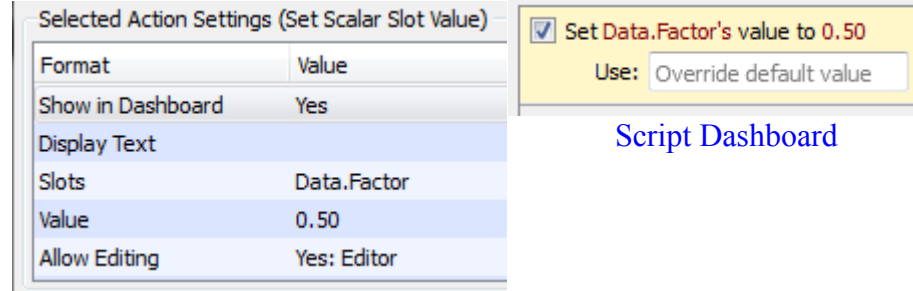
For all of the “Yes” selection for Allow Editing, you can also choose to “Show Current Value”. When Yes, then the current value (for a single scalar slot only) is shown on the Dashboard below the editing controls.



3.5.1 Editor

When the Allow Editing setting is Yes: Editor, an editable field is shown on the Script Manager. The default value will be used unless the user enters a different value in the field. Shown below are the settings to get this control.

Editor Setting



The image shows two screenshots. On the left, a 'Selected Action Settings (Set Scalar Slot Value)' window with the following table:

Format	Value
Show in Dashboard	Yes
Display Text	
Slots	Data.Factor
Value	0.50
Allow Editing	Yes: Editor

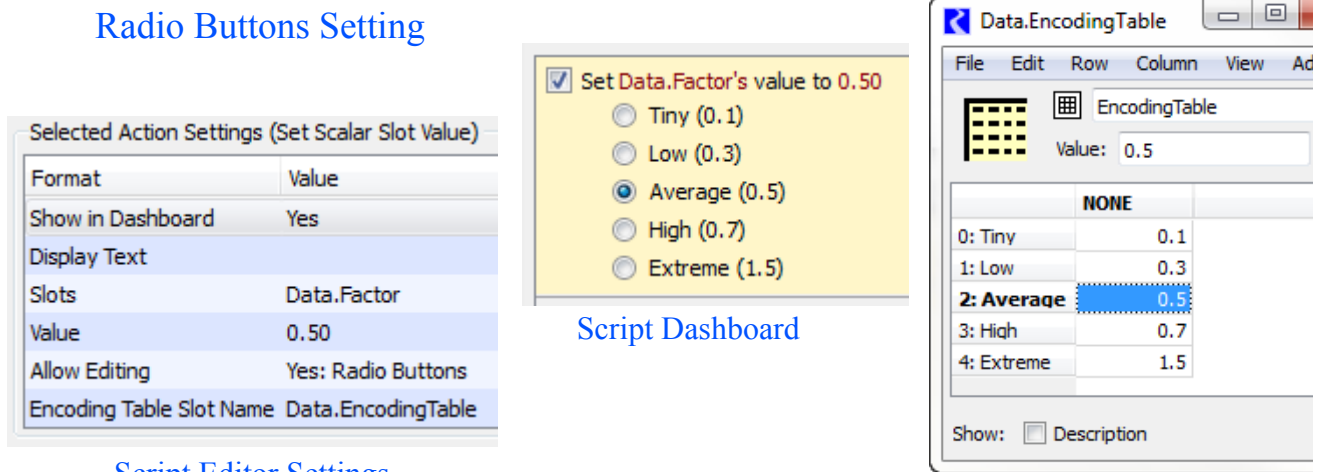
On the right, a 'Script Dashboard' window showing a checked checkbox 'Set Data.Factor's value to 0.50' and a 'Use:' dropdown menu set to 'Override default value'.

Script Editor Settings

3.5.2 Radio Buttons

When the **Allow Editing** setting is **Yes: Radio Buttons** and an **Encoding Table Slot** is specified, radio buttons are shown on the Script Manager. The default value will be used unless the user clicks on one of the radio buttons to use that value.

Radio Buttons Setting



The image shows three screenshots. On the left, a 'Selected Action Settings (Set Scalar Slot Value)' window with the following table:

Format	Value
Show in Dashboard	Yes
Display Text	
Slots	Data.Factor
Value	0.50
Allow Editing	Yes: Radio Buttons
Encoding Table Slot Name	Data.EncodingTable

In the center, a 'Script Dashboard' window showing a checked checkbox 'Set Data.Factor's value to 0.50' and five radio buttons: Tiny (0.1), Low (0.3), Average (0.5) (selected), High (0.7), and Extreme (1.5).

On the right, a 'Sample Encoding Table Slot' window showing a table with the following data:

	NONE	
0: Tiny		0.1
1: Low		0.3
2: Average		0.5
3: High		0.7
4: Extreme		1.5

The 'Sample Encoding Table Slot' window also shows a 'Value:' field with '0.5' and a 'Show:' checkbox for 'Description'.

Script Editor Settings

Script Dashboard

Sample Encoding Table Slot

The Encoding Table Slot Name setting specifies a Table Slot whose row labels and values establish a textual encoding of values. The screenshot to the right shows a sample encoding table slot. The row labels are used as the labels on the radio buttons. The values in the table are displayed on the Script Manager and will be used by the action for that button.

3.5.3 Sliders

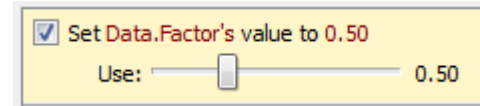
When the **Allow Editing** setting is **Yes: Slider** and **Minimum** and **Maximum Edit Values** are defined, a slider will be shown on the **Script Manager**. The default value will be used unless the user moves the slider to a different value. Shown are the settings to configure this control.

The available slider positions are computed by dividing the interval between the minimum and maximum by 100.

Slider Setting

Selected Action Settings (Set Scalar Slot Value)	
Format	Value
Show in Dashboard	Yes
Display Text	
Slots	Data.Factor
Value	0.50
Allow Editing	Yes: Slider
Minimum Edit Value	0.10
Maximum Edit Value	1.50


Script Editor Settings



Script Dashboard

4. Script Dashboard

The **Script Dashboard** is the main interface for executing the script. This dialog presents a summary and controls for the script. All settings are configured in the **Script Editor** [HERE \(Section 3\)](#). Following are features of this dialog:

- The script variable values are shown in red. Editable values are shown as either text edit fields, buttons, or sliders.
- Actions which are part of an Execute Script action (i.e. a subscript) are indented.
- Disable an action by clicking on the check box. This turns that row grey. Use **Edit ➔ Enable All Action** to enable all actions shown in the dashboard at once; similarly **Edit ➔ Disable All Action** disables them all.
- Use the **Edit ➔ Reset Values** option to revert all values in the Script Dashboard back to the default value as defined in the Script Editor.
- To run a script, specify any desired override values (where configured) in the **Script Dashboard** and then click the Run button 

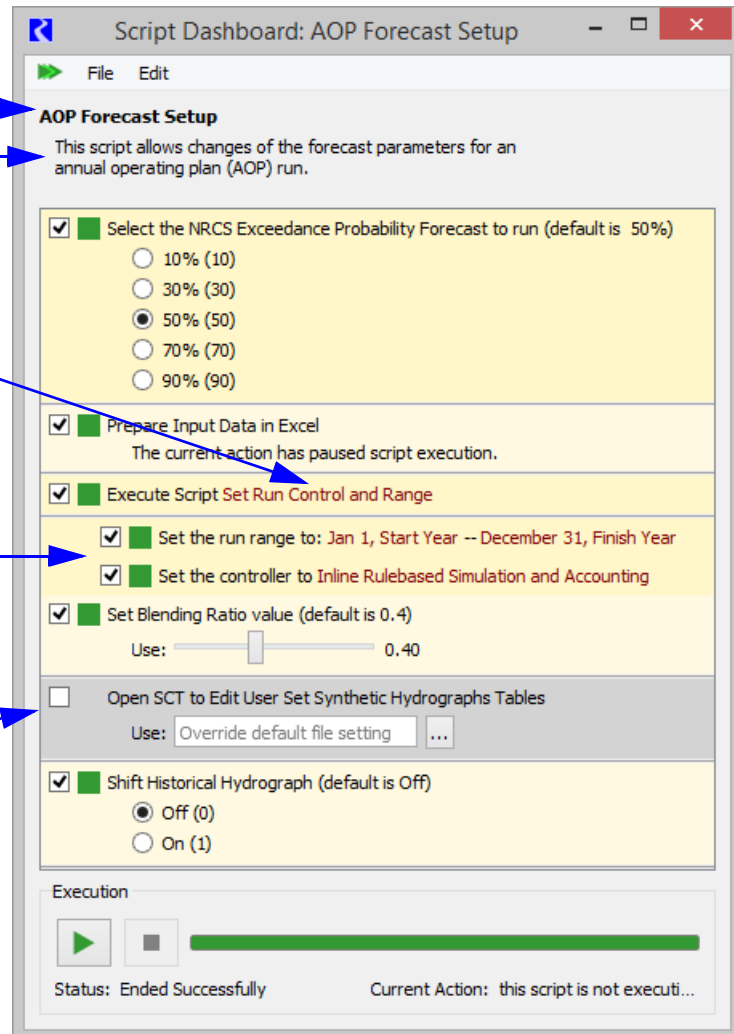
Script Name

Description

Variable values (in red)

Actions as part of an Execute Script action are indented

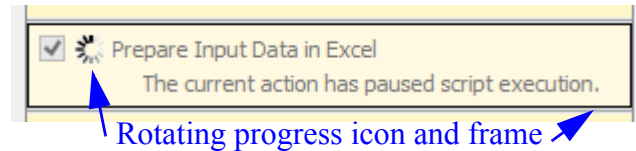
Disabled Action



Note: You can also execute a script from batch mode using the following RCL command:
ExecuteScript <Script Name>

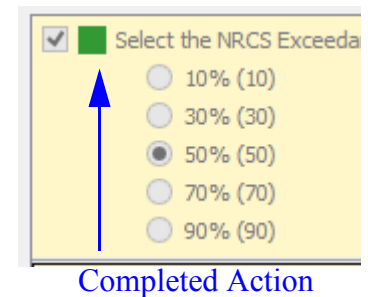
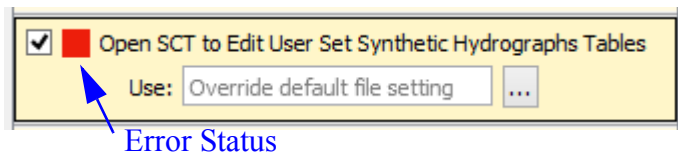
The **Script Dashboard** provides a progress bar at the bottom of the dialog showing the current action and the overall progress (based on the number of actions). As script actions execute, the Script Dashboard scrolls to keep the currently executing action in view.

A rotating icon to the right of the enable/disable checkbox and darkened frame progress through the script to indicate the currently executing action.



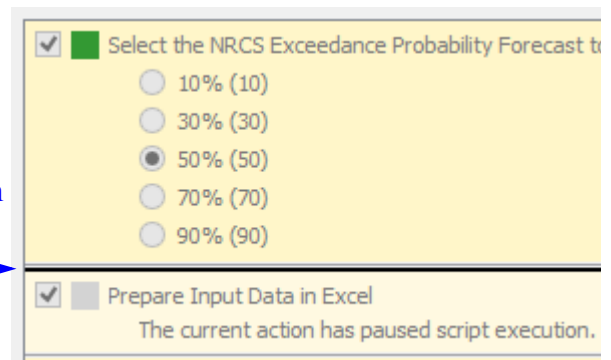
Actions that have completed successfully are indicated by a small green square to the right of the enable/disable checkbox.

Actions resulting in an error, show a red square indicator.

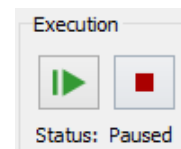


During script execution, a dark horizontal line between actions indicates a hidden action (one that is not shown in the dashboard as configured in the editor) is executing.

Line indicates a hidden action is executing



If the script fails or a Memo with confirmation is encountered, a dialog will open alerting you. For the Memo, you must click the continue button to resume execution.



Note: The script developer can specify which actions are shown on the Script Dashboard. Therefore, the dashboard may not contain all the actions executed by the script.