extendsim. 2024.R1 — Release Notes

ExtendSim Application
New Features, Improvements, & Fixes

New Features in ExtendSim 2024.R1

Multicore Analysis* to speed up experimentation:
- Run copies of a model in parallel by deploying multiple instances of ExtendSim.
- Manage multiple simulation runs defining factors and responses using the Multicore Analysis feature.
- Multi-launch ExtendSim by double clicking on the application to launch multiple instances.

* Notes on the new Multicore Analysis (MCA) feature:
- As long as your Maintenance & Support Plan (MSP) is current, ExtendSim Pro, DE, CP, and ART allow you to run models on up to four concurrent ExtendSim instances (including the Head-Node as it counts as one of your parallel instances).
- If your MSP expires, ExtendSim will still launch and run models, but will only have access for single core model runs.
- To run models on more than 4 cores concurrently, see ExtendSim Pricing on the web site at ExtendSim.com/products/purchase/pricing.

New and improved blocks:
- Multicore Analysis (Analysis library) – Launchpad for controlling Multicore Analysis.
- Analysis Manager (Analysis library) – Simplifies analysis by organizing selected factors, responses, and results from the model (dialogs or database) into one Analysis database.
- Search Blocks (Utilities library) – Search for blocks and/or hierarchical blocks in a model by name, label, category, type, tab, dialog item, and more.
- Tank (Rate library) – Flow control tab simplifies the control of filling and emptying tanks.

New Analysis library with the following blocks:
- Analysis Manager (NEW)
- Multicore Analysis (NEW)
- Optimizer (moved here from the Value library)
- Scenario Manager (moved here from the Value library)

New ModL functions:
- FolderDelete()
- FileReadNow()
- GetInstanceNumber()
- GetChildNodes()
- NumInstancesRunning()
- DBGetLinkedContentList(...)
- DBGetLinkedDialogsList(...)
- DBGetLinkedStructureList(...)
- DBDatabaseViewerShowHideSet(...)

New global variables:
- sysSMType
- sysSMDbAddress
- GLOBALINT10 to GLOBALINT99

Added to the right-click menu the ability to Add Factors and Responses to the Analysis database from block parameters and checkboxes.
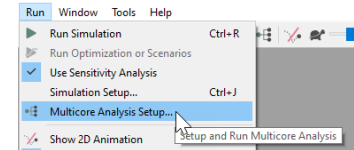
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New Features Supporting the Launching of Multiple Instances of ExtendSim

Multicore Analysis is supported in the following:
- Packages - Pro, DE, CP, and ART
- License types - Individual, Floating, and Node-Locked

New menu command and toolbar button to launch Multicore Analysis:
- *Run* menu > *Multicore Analysis Setup...*
- New button in the toolbar to *Setup and Run Multicore Analysis.*

When clicking the Multicore Analysis button, if the *Analysis* library has not already been opened, ExtendSim will try to locate and open the library before asking for the block's location. The Analysis library needs to be opened as the logic to orchestrate Multicore Analysis is located in the Multicore Analysis (Analysis library) block. This block is placed and hidden in the upper left corner of the model worksheet. It is accessible from the Multicore Analysis button in the toolbar.

Manual launching of ExtendSim instances is permitted and policed.

Child-Nodes of ExtendSim:
- Have a watermark on their model worksheet distinguishing it from the Head-Node.
- The instance number of the Child-Node is shown in its title bar.
- Cannot directly open a model.

When a Child instance is launched:
- It is minimized and a blank model worksheet is not opened by default.
- Default libraries are not opened.
- Messages are suppressed regarding libraries that are in debug mode.
- Model auto-open is turned off when launching a Child-Node.

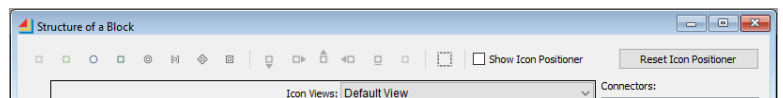New ModL functions supporting multiple instances of ExtendSim:
- NumInstancesRunning()
- GetChildNodes(integer children[], integer which)

When there is no model open in ExtendSim or when a model is running and is not set up to run on multiple instances, the *Setup and Run Multicore Analysis* button in the toolbar is disabled.

Improvements

Modifications to the *Icon* tab in the *Structure* window of blocks and hierarchical blocks:
- Connector tools have been moved from the model worksheet to the top of the Structure window in the Icon tab.
- The *Show Icon Positioner* checkbox and *Reset Icon Positioner* button have been moved to the top of the Icon tab with the other commands.

Modifications to the *Dialog* tab in the *Structure* window of blocks:
- Dialog tools have been moved from the model worksheet to the top of the Structure window in the Dialog tab.

The *Find Object* window (*Edit* > *Find...* menu item) is more consistent with options to only *Open the dialog* of the object and/or base the search on *Whole words* in the *Find Objects with:* entry field.

Change the type of connection line for multiple connection lines on a model worksheet by group-selecting them and changing the type of line.

When a block label is very long, it will not widen the area of the block icon to match the label length.

The default starting color of *Draw Objects* is now black rather than gray.

Added a *Which* argument to *StringTrim* to replace empty spaces with an underscore "_".

When calling the function *GetExtendVersion(0)*, it will return the number *2410*; "24" for the year and "1" for R1.

Application Fixes

A clone of the Histogram is now being updated when its X-axis changes.

Moving a window in the upper left corner of the application window works only if the window is completely off screen.

If the icon in a scripted block was changed, when opening a model the new icon is now properly updated.

DeltaTime is updated in the application at the time it is changed, not the time the simulation run starts.

You may change the name of the executable (ExtendSim.exe), but the new name must contain "ExtendSim".

Scientific format no longer shows unnecessary zeros after the decimal point (parameters and data tables dialogs).

When using an ampersand (&) in the title of a Checkbox, Radio Button, or Frame of a dialog item, use "&&" to add the ampersand.

When a popup menu is changed during a run, the order of message handlers has been changed to *On popupName* first, then *ResumeSim*.

The *All Objects Cursor* is capable of making multiple selections.

Fixed an issue that might occur when renaming a block AND changing its static variable list that would cause issues with instances of this block in unopened models.

The dialog box of a block now prevents the resizing of the following dialog objects: dialog tables, popup menus, and switches.

 When multiple models are open and one of those models is paused, the *Close ExtendSim* button in the upper right corner now works as it should.

When multiple radio buttons from multiple blocks are cloned to the model worksheet, they now read the correct information.

Connecting a Value Output connector to an Item Input connector is prevented. The application scans for wrong connections when opening a pre 2024.R1 model. If such connection is found, the connection is removed with a message.

When opening a block's dialog or switching between tabs in a dialog, dialog items are not preselected.

Double-clicking on a cloned dialog item with the *Clone tool cursor* now not only opens the dialog of the block that owns the clone but also selects the correct dialog Item.

The escape key (ESC) now works properly with the *Clone tool cursor*.

In the *Icon* pane of a block or hierarchical block's *Structure* window, you cannot change the connector type.

Do not pause simulation if dialog item is being edited is hidden for the time being as it will be added in a future release.

An unprotected library that contains a hierarchical block from a protected library can be compiled. When compiling an entire library, the hierarchical blocks contained in that library are not compiled. To compile a hierarchical block, open an instance of the hierarchical block's *Structure*. Make a change to the Structure to make it dirty, then *Compile* it when closing.

The *ResumeSimAllBlocks* message handler now shows up in code completion.

The *Properties* dialog for the *Line* object in the *Shapes* toolbar reports the position of its start and end point.

The *Misc* tab of the *Edit > Options* dialog no longer has the option to *Check for newer version when ExtendSim launches*.

When the number of traces changes, the *Trace Editor* updates to the new number of traces.

When there's an internal ExtendSim error, the application first deselects previously selected blocks, then selects the block at the origin of the issue.

After two back-to-back deletions of newly created connectors, the exception error handling message does not occur anymore.

Application Fixes - cont'd

When adding, then deleting a tab in the dialog of a block's *Structure* window, the crash or unhandle message has been fixed.

Fixed the potential error that when clicking in the *Find Object* table (*Edit > Find...* menu item), the table could disappear.

Connecting a *Value output* connector to a *Rate input* connector is prevented even if there is a *Named* connector in between.

In a continuous model, if End time is set to a very large number (e.g. 500000001) and it steps to a low number (e.g. 0.2), the simulation no longer ends after a few steps.

When using the *Find Object HBlock* or *Find Me* commands, first deselect previously selected objects, then select a new object.

When a *Dynamic link* is being cleared, ExtendSim prompts a *LinkStructure* message handler with a *LinkCleared* event. The message is only sent to the block in which the link was cleared.

When copying a hierarchical block from one model to another, the new *HBlockID* will be as low as possible.

The API *OpenNotebook2* opens the hierarchical block if it is not already open.

When revoking a license on a device, all instances of ExtendSim are being closed.

Error messages have been updated for the new release.

All references to Imagine That Inc. in the code base of the application have been changed to ANDRITZ Inc.

Copyright statements and error messages referring to Imagine That Inc. have been changed to ANDRITZ Inc.

Fixed crashes:
- That could happen only when animation is turned on and at the start of a simulation run.
- When deleting a dialog table clone from a Notebook.
- If an index was out or range for an array.
- When a simulation pauses for a dialog change, the run would stop instead of resuming. That could happen after calling *CloseBlockDialogBox(me)* in *on DialogClick*.
- When a dialog property window of a block's Structure was open, a crash might have occurred when using the command *Close structure window + Discard changes*.
- When selecting or editing the name of a hierarchical block connector, then trying to save the hierarchical block while the connector was still in editable mode, ExtendSim would crash.
- If the debugger window was open when closing a model, it no longer crashes.

Database Fixes

From the *Schema* view, you can now select:
- Multiple fields, then right-click to apply a command to all the selected fields (cut, copy, clear).
- Multiple tables, then right-click to apply a command to all the selected tables (clone to tab, cut, copy, clear, duplicate).

Right-click on the *Database viewer* to keep multiple selections intact.

Block Structure Fix

Fixed a crash that might occur when maximizing a dialog properties window from the dialog structure of the block.

Hierarchical Block Fixes

The red border on a hierarchical block connector (the one shown on the HBlock) now resizes properly.

If a hierarchical block is saved in a library and if the number of animation objects in a scripted block has been modified, grabbing a new instance of that hierarchical block from the library now acknowledges the change in the scripted block.

When renaming a hierarchical block connector to a long name, the name on the worksheet is now redrawn properly.

When creating a hierarchical block connector or a new hierarchical block with connectors, ExtendSim improved where the connector objects (connector name with red border) will appear inside the hierarchical block window. These objects representing the hierarchical block's connectors, can be connected to blocks within the hierarchical block window as an equivalent to connecting the blocks to the hierarchical connectors themselves.

After changing an In/Out property of a hierarchical block connector, instances of the hierarchical block now get updated when the change is propagated.

Fixed that some hierarchical blocks created in ExtendSim releases prior to 10 had corrupted connector information.

When closing a hierarchical block window, first deselect all the objects in the window.

When creating a hierarchical block, in the case of a named connection, the connector being created now has the correct In/Out property and has the proper type instead of the Universal connector.

Variable hierarchical block connectors are not supported by ExtendSim so are prevented from being created.

On an *OpenModel* search for incompatible connections made to hierarchical connectors, if an incompatibility was detected, it would break the connection with a warning message. Connections are now policed so this only applies to older models.

Function Fixes

OpenAndSelectDialogItem and *OpenAndSelectDialogItem2* do NOT pause the simulation if a parameter or editable text is selected while the simulation is running.

If *GetDataTableSelection* is called when a dialog is closed or nothing is selected, it returns a -4 error code.

DITitleSet also updates the titles of the cloned dialog items.

AbortSilent works if it is called from an *Equation* block.

Failures in the following functions have been fixed: *DBTableCopy*, *DBRecordsGetNum*, *Poke and Request with Excel*, *ListCopyElement*, and *MakeArray2/DynamicDataTable2*.

The case sensitive argument in *StrFind() Case Sensitivity Arg* is now working properly.

Fixed a crash that could be caused by *DBTableImportData*.

If *PauseSimForSave* is called, the simulation will be paused only after all the *Simulate* messages have been sent for the time the simulation was paused.

StartTime only needs to be called once now.

DBTableImportData - If importing an empty text file, the file is now closed properly.

MakeConnection and *ClearConnection* are now working with hierarchical block connections.

GetConBlocks now returns connections *on button msg* or *CheckData* as it does with on *openModel*, *ConnectionMake*, and *ConnectionClear*.

OpenFile recognizes the relative path in ExtendSim 10 for previous releases.

The *StripPathIfLocal* API is fixed for models from releases prior to ExtendSim 10.

AnimationShow() now works in the *CreateBlock* message handler.

ExtendSim Blocks & Includes
New Features, Improvements, & Fixes

Blocks -- New and Improved Features

Simulation Variable (Value library)
- Integrated reporting the *currentSim* option with Multicore Analysis (MCA).

Executive (Item library)
- Use *sysGlobalInt97* to ID the MCA block in case the MCA block is to the left of the Executive block.

Cost Stats & Statistics (Report library)
- If a model is open in a Child-Node, the block is exporting.

NEW -- Analysis Manager (Analysis library)
- Simplifies model analysis by acting as a data management system for consolidated control of parameters and collection of model results.

NEW -- Multicore Analysis (Analysis library)
- Control panel for distributing model workload over multiple instances of ExtendSim with *Multicore Analysis*.

Link Alert (Utilities library)
- Enabled the ability to select a database address using the parameters (inputting indexes) instead of popups.

Pause Sim (Utilities library)
- If a model is open in a Child-Node, you can optionally bypass the pause.

NEW -- Search Blocks (Utilities library)
- Advanced way to search a model and create a filtered list of blocks based on specific criteria.

Tank (Rate library)
- New *Flow Control* tab to dynamically apply constraints to the inflow and outflow rate of a tank.

Blocks -- Fixes

Data Import/Export (Value library)
- Only attempt an Excel cleanup if you've actually opened Excel; otherwise an error will be thrown.
- In *EndSim*, don't try to export Excel unless *Export* has been selected.

Read (Value library)
- When pasting the *Read* block when it's in Excel mode, do NOT destroy the object handles as the source block is still depending on those object handles.

Write (Value library)
- The connector label now maps properly to the field number.

Queue and Resource Pool (Item library)
- The priority of Resource Pool *OR order* was not always being respected; lower priority resources were being assigned before higher priority ones even if they were available.

Resource Pool (Item library)
- For log transactions, the field *Units released* also records the *Units allocated* when it applies (negative number).

Transport (Item library)
- Animation objects are now getting cleaned up properly.

Blocks -- Fixes - cont'd

RealTimer (Utilities library)
- Added *Date and Time* dialog item reporting when the last run was completed (and saved if open model).
- Added a +/- button to the *Duration* history log to be more in line with the way the number of rows are set in a dialog table.

Record message (Utilities library)
- Added an *Ignore Blank values* checkbox in the Option tab to ignore BLANK connector values.

Switch (Utilities library)
- Corrected the missing code that would prevent the updating to a new icon view when right-clicking on the block.

Includes-- Fixes

ExcelOleFunctions.h (Value library)
- In *XL_DestroyObjectHandles()*, conditionally ensure object handles have been updated before trying to destroy them.

Equation.h (Value & Item libraries)
- *iVar* and *oVar* name length check.
- Recompile is forced in open model if the application is 2024.R1, but the model was created in ExtendSim 10 or earlier.

RP procedures.h (Item library)
- The field for *log transaction* was a *type* string instead of *real* causing the decimal numbers to not be displayed properly.
- The fields for *log transaction* were *integer* instead of *reals*.

Tank functions.h (Rate library)
- Added *block number* to an error message as it was difficult for the user to know where the error message was coming from.
- Linked to *Flow control* in Tank: The content was not being sent to the value output because the block did not anticipate the change of rate that was about to happen causing the plotter to miss information.
- If during the simulation run the maximum input or output flow rate is changed, first the content into the Tank should be updated otherwise the calculated content might be incorrect.

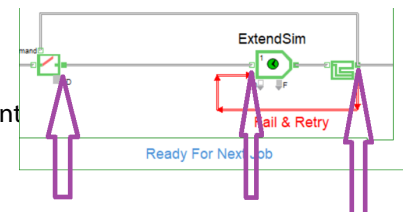CHART_DB_ValuesFromDB.modl (Chart library - DB Line Chart block)
- If the date format field in the database table time field, then time date should be transformed into *currentTime*.

Known Issues

Using *RightClickConnect* inside a hierarchical block to a block connected to a hierarchical block connector could cause ExtendSim to crash.

If the *ClearConnection* API is called from 2 blocks that are connected through hierarchical block connectors (at least one intermediate hierarchical block connection between the connected blocks), ExtendSim might crash. In previous releases, ClearConnection would just fail.

When executing the menu command *Model > Make Selection Hierarchical...*, the hierarchical block created could miss some of the hierarchical block connectors that should be created. Because of that, the *Make Selection Hierarchical...* command can disrupt model behavior by making connections disappear. This happens when multiple connectors connected to the hierarchical block are on an identical angle. In this example, if enclosing the *Gate* block into block, a connection from the *Gate* to *Activity* should be created and another connection from *Demand* to *Select Item Out*. In 2024.R1, only one connection would be made because both connections are aligned (same angle).

Note: If you need us to provide you a fix for any of these issues, please contact Support.ExtendSim@Andritz.com.