



WHAT IS NEW IN PSCAD/EMTDC V5.0.2

Since PSCAD/EMTDC v5.0.1

Date: March 28, 2023

To display “What’s New” documents for other PSCAD versions and other MHI products, please refer [here](#).

PSCAD

Functionality Deficiency Fixes

Load Speed Greatly Enhanced (#9022, #9302)

Dozens of speed optimizations are now implemented in PSCAD with the primary goal to enhance project load speed. Given our very large testing workspace, containing 100+ projects as a benchmark, speed improvements are as follows:

- v5.0.0: 11 minutes to load.
- v5.0.1: 7.5 minutes to load.
- **v5.0.2: 2 minutes to load.**

Python Automation Updates (#9190, #9185, #9210)

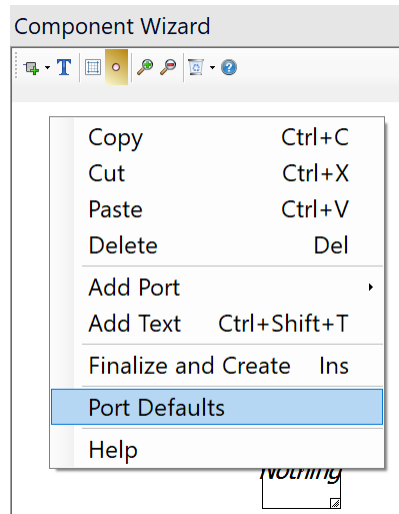
Several updates have been made to the python automation capabilities in PSCAD:

- Library project command *Create Compiled Library (*.lib)* is now included.
- *Edit Reference | Namespace* and *Definition Name* now automatable.
- Added the ability to automate the modification of definition settings (`<definition>.parameters()`).
- Added the total number of definition instances as an attribute (`<definition>.instances`).



Component Wizard Port Defaults (#9251)

Users can now set default port properties that are applied when creating new ports in the component wizard.



Bug Fixes

The following is a list of bugs that were discovered and fixed since the latest, previously released product.

1. Signals generated from sequencer components are now created correctly (#8965).
2. **A PNI simulation will no longer stall and fail if two, alien or foreign-end t-lines possess identical names (in different projects) (#8968).**
3. The *.infx, EMTDC output information file now includes output from outside library projects (#8969).
4. Password type parameters will now accept empty strings (#8899).
5. When you switch views between projects, the zoom level in the graphs is no longer lost (#8125).
6. When panning a schematic canvas using Ctrl + Shift + left mouse hold, the panning no longer stops if the mouse pointer goes outside the window frame (#8970).
7. Zooming the schematic canvas is no longer forced about the canvas center (#8979).
8. When moving any group of components, or a selection, the project is now properly marked as modified (#8978).
9. **The *.psout EMTDC output file is now created properly when starting the simulation from a snapshot (#8996).**



10. **Application will no longer crash if a terminal is missing a node, or a node is missing a signal. These events can be triggered by a datatap component output being attached to an electrical node (#9004).**
11. Build messages, when attached to a support request (from the support request frame) are no longer un-intelligible (#8956).
12. The make utility no longer emits garbled messages to the build message window (#9035).
13. Build messages sourced from module components whose definition is stored in a library, are now routed to the build message window of the case project being compiled, not the library project (#9040).
14. **PSCAD will now properly bind to the socket when using a non-ASCII hostname (#9015/#9032).**
15. **The text file created to describe mutual Z and Y matrix data for mutual coupling is now properly formatted (#9016).**
16. Debug-related project settings now properly persisted following the creation and then saving of a new project (#9067).
17. Graphs no longer erroneously mark the project as modified while the project is opening (#9006).
18. **Application will no longer crash if the build process is terminated at certain times (#9076).**
19. **Application will no longer crash when selecting two non-module components to launch the schematic comparison tool (#9093).**
20. Support request attached build messages file is now formatted properly and readable (#8956).
21. Fixed memory leak in blackbox algorithm (#9069).
22. Diagnostic information within the project settings is now properly handled on creation of a new case project, and hence the settings will now be saved with the project properly (#9067).
23. **Application no longer crashes upon stopping the simulation with the application option 'Copy .dll to local folder (gf46)' enabled (#9076).**
24. **Disabled the ability to invoke the module comparison tool via non-module components. Such an operation would lead to an application crash (#9093).**
25. **Fixed sporadic crash that can occur when editing component parameters and accepting changes very quickly (#9134).**
26. Resource files now update properly following a modification within an external program (#9123).
27. A proper build message is now displayed when using the programmable pause component. Also the status bar run time is updated to the exact pause instant (#9166).
28. The ComFab now properly deletes the master connections when closing the connections after a run. This issue had sometimes caused memory handles to build up and leak (#9170).



29. Component properties now properly formatted as CSV when selected as such, when exporting to file from view properties dialog (#9196).
30. **Scatter plots no longer cause PSCAD to crash if they have data that is not initialized properly (#9219).**
31. Column headers are now properly quoted when exporting component parameters to a *.csv file. Previously, if the parameter description contained a comma or other character, it could corrupt the *.csv file (#9198).
32. Component parameters set to 'invisible' are now properly ignored by the script compiler (#9216).
33. If a real, global substitution is used within an integer-type parameter, a type conversion warning is now properly issued (#9111).
34. Tabs are now properly rendered by sticky notes (#9132).
35. It is no longer possible to set a global substitution name to an empty string by deselecting pane while the name is empty (#9213).
36. The #COMPONENTID script directive is now properly supported when saving projects as v4.6 format (#9202).
37. R, X and B values are now properly displayed in solved t-line and cable properties component parameters (#9228).
38. License certificate expiry warning message now displays time to the minute, if necessary (#9231).
39. New component instances no longer lose their definition reference, if the definition exists in an external library and the name is changed prior to it being instantiated (#9232).
40. Schematic canvas zoom from the ribbon buttons now functions more consistently: For example, if a component is selected, zoom will be centred on that. If not, the canvas view centre point will be the focus (#9174).
41. Quick disable graphic now properly supersedes layer-based disable to match the actual disable priority (#9110).
42. Overlay graphs created directly from an output channel component, now inherit the min/max, y-axis settings from that component (#8763).
43. Vastly improved drawing speed during simulation and zooming, when curves are set to points-style (#9244).
44. Greatly improved simulation run speed when zoomed out and viewing many components (such as buses) that utilize component state animation (#9238).



45. **If a mutually coupled line has one end not attached to the same sub-system then it was possible, depending on arbitrary ordering of nodes, that the t-line would wind up coupled to two different sub-systems and would result in DSLINT errors from EMTDC. This issue has been fixed (#9246).**
46. Resources in the resources branch of library projects are now included as part of a case project build, even when the resources are not linked to a dependent module in that build (#9257).
47. Choice parameter descriptions that contain '=' (and other) characters will no longer get truncated when displayed within component graphic labels, when using the getChoiceText(...) macro (#9250).
48. Component wizard no longer spills graphics from sliding tray when pane is very small (#8275).
49. The Paste menu item no longer appears disabled when copying/pasting a component parameter from one component to another, while in component edit mode (#9300).
50. **Fixed an issue where PSCAD can stall during a multi-run simulation, where a significant amount of back and forth communication occurs. The stall was caused by a 'race condition', which would result in a corrupted communication buffer (#9312).**
51. When drawing curves with a filled style with best speed drawing, if the curve itself is outside the Y bounds of the graph aperture, the curve will now be drawn correctly (#8509).
52. **Save as v4.6 (from V5) now properly exports V5 format Global Substitutions to the v4.6 format (#9275).**
53. All functions in the schematic tabs context menu now function properly (ex. Close all tabs to the right) (#9339).
54. C-files auto generated by the component wizard no longer contain invalid line endings, if the component is created through the copy-paste mechanism. Fortran files auto generated by the component wizard no longer contain invalid directives (#9343).
55. Workspaces containing many cases (hundreds) no longer take an inordinate time to load. Optimization techniques have been implemented to greatly reduce load and layout time (#9364).
56. T-lines and cables can now be removed from a layer via its context menu (#9365).
57. After creating a new module instance, the canvas view position in the module no longer defaults to view position of the module, from which you are navigating. That is, the default canvas view is always top left and default 150% zoom (#9366).
58. The Paste context menu item now functions properly in the component definition graphics canvas (#9347).
59. When selections are nudged or dragged outside the visible area of the schematic canvas, the canvas will now auto-scroll so that users can see what they are doing (#8666).



60. Shrunk graph frames, copied and pasted as metafile format, no longer display graphs outside the graph frame view (#9402).
61. Graph frames scroll bar grips are now painted so as to be more identifiable. Previously the grips were difficult to see, as they were painted the same colour as the graph frame panel (#9399).
62. **PSCAD will no longer crash if a module definition is given a new name, while the module is being viewed (9435).**
63. **PSCAD will no longer fail to launch if the current operating system has an IPV6 address set as the priority one (9432).**
64. Viewing the ribbon File tab is faster now when there are deleted files, or file located on a slow network drive, in the previous file lists (#9443).
65. **PSCAD will no longer crash on compile because of an invalid cable or t-line definition (#9461).**
66. **PSCAD will no longer crash when the OK button is pressed on an empty component parameter dialog (#9459).**
67. Blackbox now properly handles global substitutions placed in non-supported, literal component parameters inside the module being blackboxed (#9487).
68. **The workspace pane view no longer 'jumps around' when navigating a project tree containing a large number of projects (#9187).**
69. When a scenario has been modified an attempt is made to unload project without first saving the scenario modification, the modified scenario is now saved to the project properly (#9504).
70. Added support for MATLAB versions R2009bSP1 (7.9.1), R2022a (9.12), R2022b (9.13) and R2023a (9.14) (#9519/#9521).
71. **PSCAD no longer crashes when unloading a project that causes a navigation event to take place (#9513).**
72. Fixed erroneous duplicate namespace message that could pop up when editing project settings (#9557).

EMTDC/MASTER LIBRARY

Bug Fixes

1. When filter coefficients A1 and A2 set to 0.0 in the PSS1A stabilizer component, the results are now the expected (#8967).
2. When using i-lambda data entry in the saturable reactor component, with the number of points set to 4, the 4th point for flux linkage is now properly visible (#9080).



3. The ST4B exciter component no longer displays transient behaviour at initialization under some specific configurations (#9054).
4. Entering a zero as the initial operating head in the hydro turbine (hy_tur) master library component, no longer produces NaN runtime error (#9092).
5. Snubber circuit graphics on the peswitch component now disappear as expected when the snubber circuit is disabled (#8951).
6. Entering non-zero copper losses no longer results in the secondary signals being zero (#9197).
7. The visual appearance of the sample and hold component is now correct when two inputs are selected (#9161).
8. The surge generator component is now compatible for use in PSCAD v4.6.
9. Fixed an undefined parameter used in script error in the pipe-type cable component (#9220).
10. Wound rotor induction machine: Leakage saturation data entry is now enabled if leakage saturation is selected on both stator and rotor. Number of data points in the leakage saturation is now used in the script section (#9258).
11. Dependent sources now produce correct results in the 2nd and subsequent runs in a multiple run (#9293).
12. The string to save channel titles in the multiple run extra recording component are now sized correctly (creating a buffer overflow situation) (#9310).
13. Fixed a code error in the MMC half-bridge model where variable VR1 was used in place of VR2 (#9292).
14. The DC4B exciter component now properly creates the port associated with the VS input, when the stabilizer input is enabled (#9290).
15. Fixed a spelling error in the coupled_3lines component script code (#9282).
16. The fixed load model now exhibits the proper behaviour outside the limits of 0.8 and 1.2 pu (#9094).
17. Under certain conditions, the scaling value in the scaling component had to be N+1 to get the scaling of N. The component now emits an error message if -1 is given as the scaling value (#9240).
18. The fault component now properly turns red when a fault is activated (#9383).
19. The duality transformer component, with taps enabled, now produces the correct frequency scan output (#9376).
20. In certain situations, the frequency scanner component no longer gets locked into an unrealistic value (#9382).



21. The duality transformer component no longer creates bad code when BH data with dimensions is chosen as saturation method (#9414).
22. A continuous zero-value input no longer creates unreadable data in the COMTRADE component output (division by 0 issue) (#9445).

PYTHON SCRIPTING

Bug Fixes

1. When recording a script, and the size of a graph frame is changed, the proper command is now scripted: `frame.size = (##, ##)` (#8982).
2. Project settings can now be modified when using Python to launch PSCAD on a clean machine (ie. where the user settings file does not exist) (#9136).
3. **Application no longer hangs/crashes on run after switching the Fortran compiler using a Python script (#9115).**
4. Proper script is now recorded when editing the settings of a component definition (#9210).
5. Proper script is now recorded when renaming a component definition (#9285).
6. Export/import of component parameters is now recorded properly (#9183).
7. Export/import of global substitutions is now recorded properly (#9280).
8. Fixed an issue when using Python script to launch a simulation set, when application option On Startup is set to Restore the last session workspace (#9434).
9. Fixed cache issue involving setting file parameter 'copy_file', which was causing defined file objects to not get copied to the temporary folder (#9585).

UTILITIES

Functionality Deficiency Fixes

1. PSCAD licensing now supports Federal Information Processing Standards (FIPS) compliant algorithms (#8973).
2. The Python installer is now treated as a separate sub-product and can easily be disabled from being installed, can be easily updated without having to rebuild the entire PSCAD installer (#9296).
3. If a lock ID is outside the last known EMTDC range, then it defaults using the largest known # of EMTDCs, instead of defaulting to 8 EMTDCs (#9324).
4. PSCAD will no longer default to TLS 1.0 if you first do not run the 'Server contact test'. Now TLS 1.2 is always used (#9104).



PSOUT VIEWER

Bug Fixes

1. The time domain column is no longer duplicated when exported from *Advanced* (*.psout) to *Legacy* (*.out) formatted EMTDC output files (#9322).