

Micro-Cap 12

Installation:

To install Micro-Cap 12 run the setup.exe from the CD and follow the instructions. Do not install on a write-protected area like Program Files. Micro-Cap writes to its installation folder so the folder needs to be writable. No security key is required.

New Features in Micro-Cap 12

Schematic Editor:

Spreadsheets: Spreadsheets can now be placed in the schematic. In addition to following the usual spreadsheet format and usage, they also have access to simulation variables such as V(OUT), I(L1), etc.

Enhanced Region Enable: Ways to enable components or entire regions now include Expression Value, Check Box, and Buttons. These are particularly useful in quickly comparing the effect on analysis plots of different circuit options.

Pinned Files: Frequently used file names can now be pinned to the Recent Files list and abbreviated path names simplify the list.

Localize command: The Localize command now embeds all companion files (*.usr. etc). Localizing a file is important to ensuring the circuit works as expected when you send it to a colleague. It avoids the problem of missing or different versions of models, subcircuits and other important circuit information.

PWL Import: Added ability to import a waveform to a PWL Voltage Source from an Excel file or from a CSV file.

Parts Library: The parts library has been increased to 45,000+ parts.

New graphics objects: 28 new flowchart symbols plus closed and open polygons, triangles, stars and pies are now available in the schematic and analysis plots. Objects can have picture, pattern and gradient fills. Objects can be rotated. Immediate update without waiting for the Apply button.

New BSIM MOSFET model: The BSIM4 model has been updated to the latest U.C. Berkeley BSIM4 4.8.1 dated Feb. 14, 2017.

Attribute dialog box: You can now have 1, 2, or 3 model parameter columns in the Attribute

dialog box making inspection and editing easier.

Fine placement: Selected schematic objects (components, graphics, lines, text, etc.) or regions can now be moved with cursor keys for fine control of placement.

Block Editor: New block shape editor for arbitrary package outlines and pin counts.

Stop sign: A stop sign marks the component at which an error occurred.

Large toolbar icons: Large toolbar icons were added to offer easier viewing on very high resolution monitors.

Build command: The commands `.RELTOL` and `.TR` were added to the Build command function.

Rename command: This command now has options to update disabled parts, search on current page only, and have a starting value.

BOM: Revised and improved the Bill of Materials report to include drag and drop formatting of columns.

Pan mode: Added a Pan mode to circuit schematics, 3D plots, and analysis plots. This lets you drag the view with the left mouse. CTRL + right mouse drag still pans as before.

Info Page: This page, which shows the detail about where each model or circuit file used in the simulation was found, can now use generic references to library or data folders. This simplifies the display when lengthy path names are used.

Page Tabs: Added a down arrow for schematic page selection.

Additional Formats: Added current and power numeric formats to the Format tab of the Schematic Properties dialog box (F10).

.Macro: The file names of models that use `.Macro` statements now show in the Attribute dialog box. Previously, models like SCRs and thyristors that use `.macro` statements did not appear in a drop down list.

Calculator: Three tabs were added to the calculator:

Combinations lets you see how to form resistor, capacitor, or inductor values from standard values.

Local .Defines creates .define variables that are local to the calculator.

Expand Defines lets you see how .defined variables are constituted. This is useful when debugging complex expressions.

Nom.lib: Nom.lib is now accessible from the Options menu.

Bold non-default preferences: On the Preferences dialog box, non-default values are now shown in bold.

Model Program Tabs: Added tabs to select different graphs.

Analysis:

Monte Carlo: Monte Carlo routines were improved in several ways:

- 2D and 3D histogram choice was added.
- The ability to view the tolerances used for individual cases was added.
- The ability to create a circuit for any case was added.
- Asymmetric tolerance (+80%,-20%) was added.

Probe:

- AC Probe: The Analysis Limits dialog lets you control how the AC values are displayed on the schematic (e.g. Real, Imaginary, Magnitude. etc.)
- In Cursor mode the schematic shows the values at the cursor position.

Parameter passing: Text can be passed as a parameter to subcircuits.

Temperature variation: Temperature can be a function of time or other circuit variables.

Import and export: Importing and exporting of waveforms and curves was made easier through direct export of analysis plots to Excel, text file, or the clipboard. PWL source waveforms can be imported from Excel or a text file.

Smoke / Stress Analysis: An entirely new analysis tool called Smoke was introduced to assess how close circuits are to violating maximum operating limits.

Enhanced Worst Case: The Worst Case routines were improved:

- Improved Editor: The editor used for setting the various bias tolerances has been significantly improved. Undo and redo added to the editor.
- Bias Templates: You can now use templates for common types such as Drift, Temperature, Voltage Stress, Radiation, Etc.
- Asymmetric tolerance (+80%,-20%): Asymmetric initial tolerances are now supported.

State Variables editor:

- A Nodeset command was added that creates a .Nodeset using current state variable values. This command work similarl to the .IC command.
- The editor window was made larger and expandable.

Optimizer:

- New Random and Step All modes for searching for local optima.
- Optional log tracks progress through the optimization steps.

Smoothing: A set of routines was added that provides optional user-controlled smoothing at the corners of Pulse and PWL Voltage and Current sources and for LIMIT and TABLE functions in NFV, NFI, NTVOF, and PSPICE dependent sources. The purpose of smoothing is to enhance overall convergence.

Save Start: The Run Options / Save command now starts saving at Output Start Time for Transient, reducing file sizes and improving retrieve speed.

.RELTOL command: A .RELTOL command was added that allows a time specified value for the simulation control parameter RELTOL.

.Define comments: Comments may now be added to .define statements. Comments are prefaced with a semi-colon (;) and placed at the end of the .define statement. For example,

```
.DEFINE AVG1 AVG(V(1)) ; AVERAGE VALUE OF NODE 1 VOLTAGE..
```

New Opamp variables: VP VM IP IM IOUT IEE ICC. For example, IOUT(O1) measures the output current of opamp O1. VM(O7) measures the voltage on the minus input pin of opamp O7. IEE(O2) measures the current into the negative power supply of opamp O2.

<Root>: <Root> refers to the folder containing the Micro-Cap executable folder and may be used as a short reference to it in file path names.

Undo for Analysis Limits: The Analysis Limits dialog box for every analysis type now has a full undo / redo. If you delete a row or add one it is undoable, as are any changes in the dialog box.

Smart Paste: The data for USR, PLA, and STM stored in a file page, is now pasted along with the component when it is pasted into another circuit.

Numeric Output: The process of creating numeric output was sped up by 25%.

PHASE2 function: A PHASE2 function was added that measures the dynamic phase relationship between two sinusoidal waveforms.

Peak Function: A peak function was added. Identical to the MAXR function.

