QUICK HELP

Multilevel

Caspoc is a multilevel simulation and animation program. Therefore you can combine system and circuit components in one schematic. Circuit nodes are round and system nodes are square. Connect circuits and systems using controlled sources and sensors. Do not make a connection between circuit and system nodes

Select a component:

Move the mouse over the component on the left side, click and release the left mouse button over the component, drag the mouse and click the left mouse button again to place the component.

Move component:

Click the component with the left mouse button, drag the component and release the left mouse button to place the component.

Draw wire:

Click with the left mouse button on a node, drag the mouse and draw the wire by releasing the left mouse button
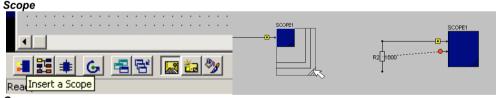
Remove component/Wire:

Click the component/Wire with the left mouse button and press the [Delete] key on the leyboard

Edit component parameters:

Click the component with the right mouse button

Move selection:

Draw a rubber band around a group of components/wires, by keeping the left mouse button down during drawing the rubber band. Move the selection by dragging the selection with the left mouse button down.

Scope

Open a scope :

Click the right mouse button on the scope, use the arrow keys to step through the scope results

More scope inputs:

Drag the right bottom scope tip with the left mouse button

Measure voltage in scope

Connect the scope input to a node, by clicking, dragging and releasing the input of the scope over a node using the left mouse button

Measure current in scope

Connect the scope input to a component, by clicking, dragging and releasing the input of the scope over a component using the left mouse button.

Tscreen / dT

Tscreen is the length of you screen and dT is the step size for the simulation. For rectifiers choose Tscreen=100m and dT=100us, for a PWM power electronics choose, for example 20kHz, Tscreen 1ms dt=1us

Ground

After inserting the first component in the schematic, Caspoc asks you automatically insert a 'Ground' node. Always have at least one ground node in your electric circuit, which has 0 volt.

Where to find components

Power electronics
- Basic components in components/circuit R L C Mosfet Diode IGBTetc
- DC sources as well as AC sources are in components/circuit/sources
- Control sources in components/library/source/system   SinWave SquareWave TriangleWave
- Control blocks for smps in components/library/control/smps
- PI controllers in components/library/control/continuousControllers
- Discrete PI controllers in components/library/control/DiscreteControllers
- Current and voltage measurement in components/library/sensors
- Sample &Hold and ADC are in components/library/controllers
- ADC are to be found as the FIX block in components/blocks/Nonlinear
- Average components for buck and boost are in components/library/powerconverters/averaged

Electric drives
- Electrical machines are in components/library/electricmachines
- Inverters and modulation are in components/library/powerconverters/inverters3phase
- Mechanical loads are either in components/circuit/rotational for basic linear components like inertia, bearing and shaft deflection (spring), while more eleborate models are to be found in components/library/mechanical/rotational for gearbox, stick-slip and quadratic loads.
- Voltage and current measurement are in components/library/sensors
- Park and Clarke transformations are in components/library/electricmachines/transformation
- Interfacing from two signals (alpha,beta or dq) into one vector signal are in components/library/AED/Interface, use signal2vector to create the vector signal and use vector to signal to get back to two separate signals
- Vectorized mathematical operations are to be found in components/library/AED/math/vector
- Vectorized PI controllers are in components/library/AED/control/vector and in components/library/AED/Discrete/vector
- Vectorized limiter is in components/library/AED/NonLinear/vector
- Vectorized Ac source is in components/library/AED/source
- Vectorized as well as scalar park/clarke/polar transformations are in components/library/AED/Transformation/General

Solar

Solar cells, modules,arrays as well as MPP controllers are in components/library/GreenEnergy/solar

Wind Energy

Wind turbine, Cp and maximum power control are in components/library/greenenergy/wind

Grid Connection

See the section on electrical drives for three phase inverters and modulation as well as the section on power electronics for the control

Battery

Battery models are in components/library/electric/battery

Filters

Filters are available as continuous or in discrete for in components/library/filters

Transformers

Single and three phase transformers are in components/library/transformers

Power Systems
- Specialized components for power system modeling are in components/library/powersystems, such as power lines, distributed lines, PQ loads, switches and faults
- Converters for power system modeling are to be found in components/library/powerconverters/system

Sensors(Voltage/Current/Power/Speed/Torque)

Measuring Voltage, Current, Power, Power Factor as well as Angular Speed, Torque, Rotational Power, are in components/library/sensor

Start Simulation

Enable the animation

100% or view all

Pressed: The simulation holds after Tscreen seconds, press [ENTER] to continue. Not pressed, the simulation keeps on running

Simulation Parameters
Tscreen = length of your screen
dT = simulation step size ($< Tscreen/1000$)

Search for components: Enter a search term (for example: solar) and click the magnifier button, select a component from the list.

Open the scope with the right mouse button

CASPOC - QuickStart.csi [Modified]

File Edit View Insert Tools Simulation Options Help Quick Help

Caspoc Full

Components
Circuit
Browse&Search
RLC
R
L
C
K
LBR
Sources
Controlled Sources
Semiconductors
Miscellaneous
Spice
Translational
Rotational
All

MUL
3
4
MUL1
12

+
B1

out
12[Volt]
R1 1

SCOPE

R2 1

Ground
0[Volt]

R2= 1Ohm
v= 6[V]
|i| = 6[A]
P= 36[Watt]

MUL
V(out) VOLTAGE1   12
P 72

I(R1) CURRENT1 6

Ready   Tscreen= 1s, dt= 1ms BE/RK4   t=1.000   R2= 1Ohm v= 6[V] |i| = 6[A] P= 36[Watt]

T   = 1e12
G   = 1e9
MEG = 1e6
K   = 1e3
M   = 1e-3
U   = 1e-6
N   = 1e-9
P   = 1e-12
F   = 1e-15

For example:
R=1Kohm
C=1uF
L=1mH

Insert as Scope

Insert a Note

Insert a UpDown

Freeze and Go-Back to replay the simulation

Enter numerical value by clicking the node with your right mouse button

Move your mouse pointer over a component

File	Viewing	Editing	Scrolling	Zooming
[Ctrl]+[O] *Open*	[F1] *Online Help*	[Esc] *Cancel selection*	[Ctrl]+[←] [↑] [↓] [→]	[+] *Zoom in*
[Ctrl]+[S] *Save*	[F5] *Redraw scope*	[Esc] *Cancel drawing wires*	[PgDn] [PgUp] [End] [Home]	[-] *Zoom out*
	[F7] *Toggle Animation*	[Delete] *Selected Components/Wire*	*Scroll the schematic*	*Numerical Keypad*