

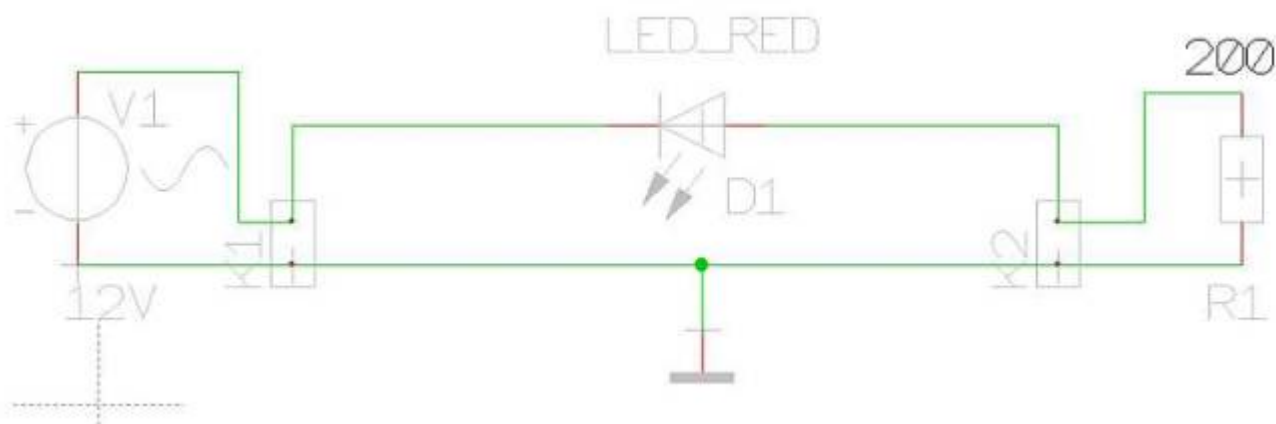
Simulate the function Part 2

From IBF-Wiki

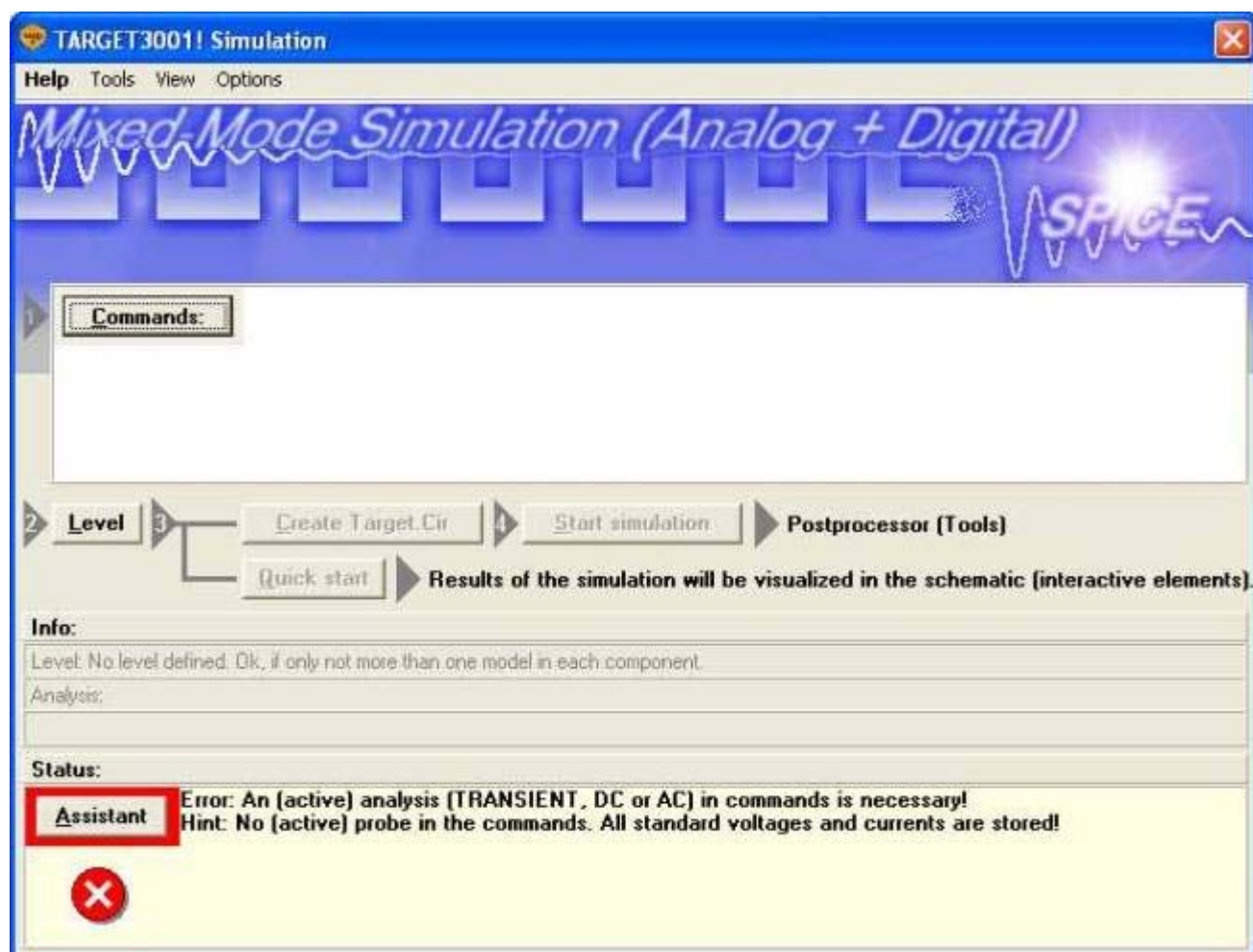
This article is part of an introduction tutorial called CrashCourse2

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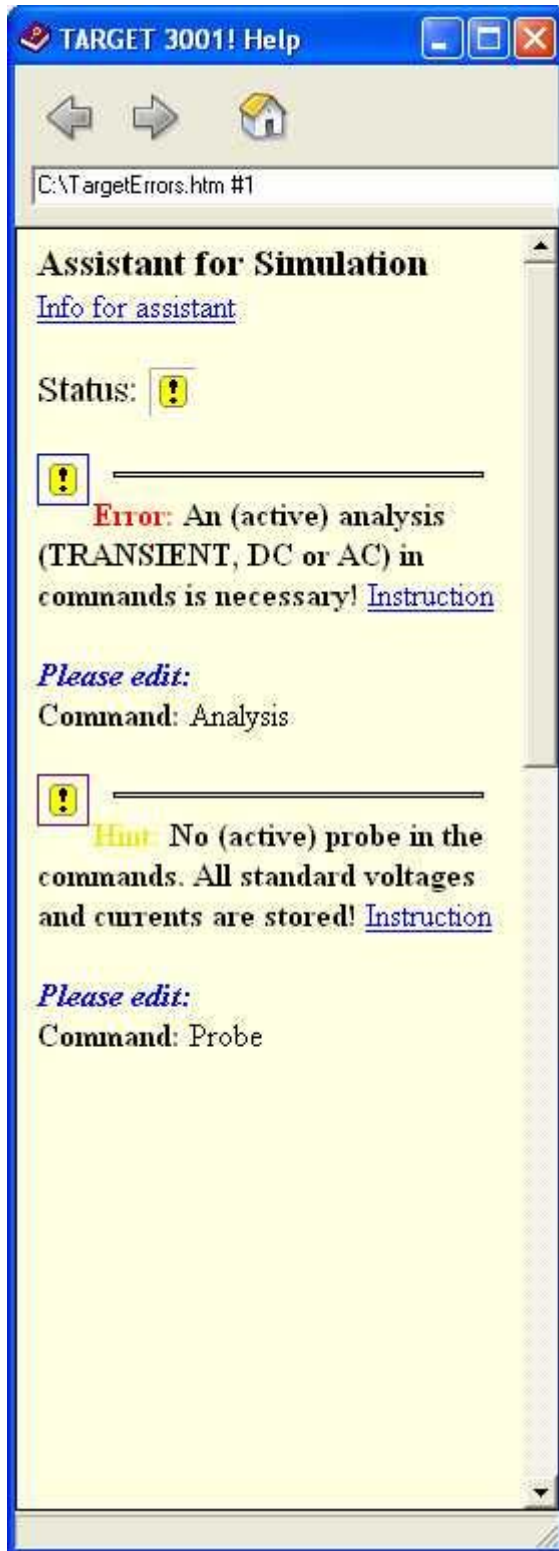
Based on the following schematic...



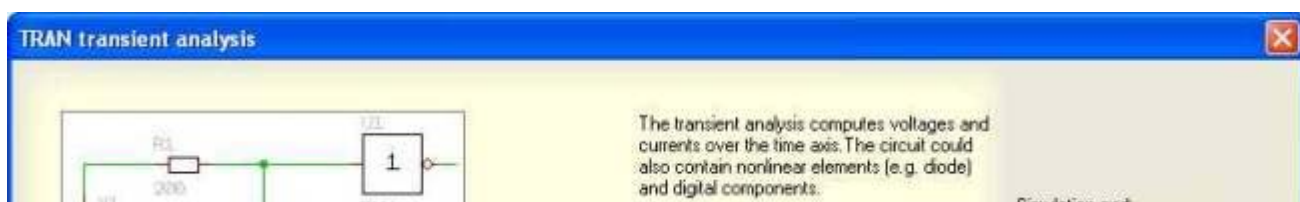
...we start the real simulation. We want to know which current flows in the LED at which tensions. First we start the simulation tool by the use of the function key [F9]. The following dialog appears:



Look at the assistant. It warns in a line, that some of the components don't have a model. By M11 on this line we learn...



...that the connectors obviously don't have a simulation model. We ignore this message, because we don't want to simulate their function anyway. Furthermore it is said: **Error: An (active) analysis (TRANSIENT, DC or AC) in commands is necessary.** and an advice follows: **No (active) probe in the commands.** Thus we click M1 on the commands button. Under "Add" we choose "Transient-Analysis". The following picture appears:



The next time step will be automatically calculated/adapted by the simulator (automatic step control), but the steps can also be limited to a maximum value (e.g. for smoother curves, convergence).

The step at the time 0 has effects on the convergence/computation of the necessary dc operating point. With "use initial conditions" the initial values of some components (e.g. capacitor loaded with 12 V) could be included.

200m [s]
 Begin save at time: 0 [s]
 Step at t=0: 10u [s] (*)
 Max step: 1m [s] (*)
 Use initial condition

(*) The time steps are automatically checked and improved, for that purpose the periods and slopes of the sources are taken into account (no subcircuits).

Info [Default] [OK]

At a sinus tension with 50 (Hz) (= a period of 20ms) we choose the end of the simulation at a decuple (=200ms), so we see 10 oscillations. The step width we choose rather small, for getting a smooth curve. Here a maximum step width of 1ms. As step width for a successful definition of a initial calculation point (convergency) we choose 10µs. Press OK. In the "Commands" button we now add: Probe. The probe-dialog opens. Here we define tensions and currents which shall be saved for simulation (if no probe is added, standard tensions and currents are saved).

Probe: Save and monitoring

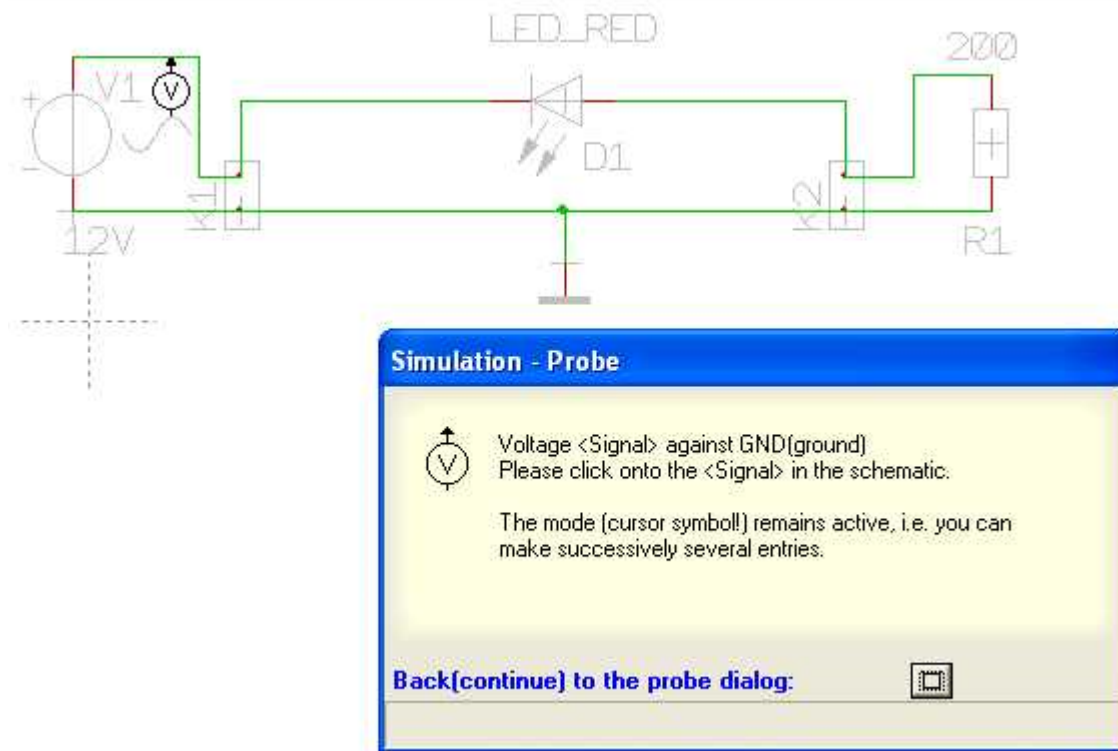
Selection of the voltages, the currents and digital signals, to be stored for later view. Some signals can be shown also during the simulation (Monitor).

All standard voltages/currents are stored, if you do not make a selection!
 Here the storage requirement and the computing time are much higher.

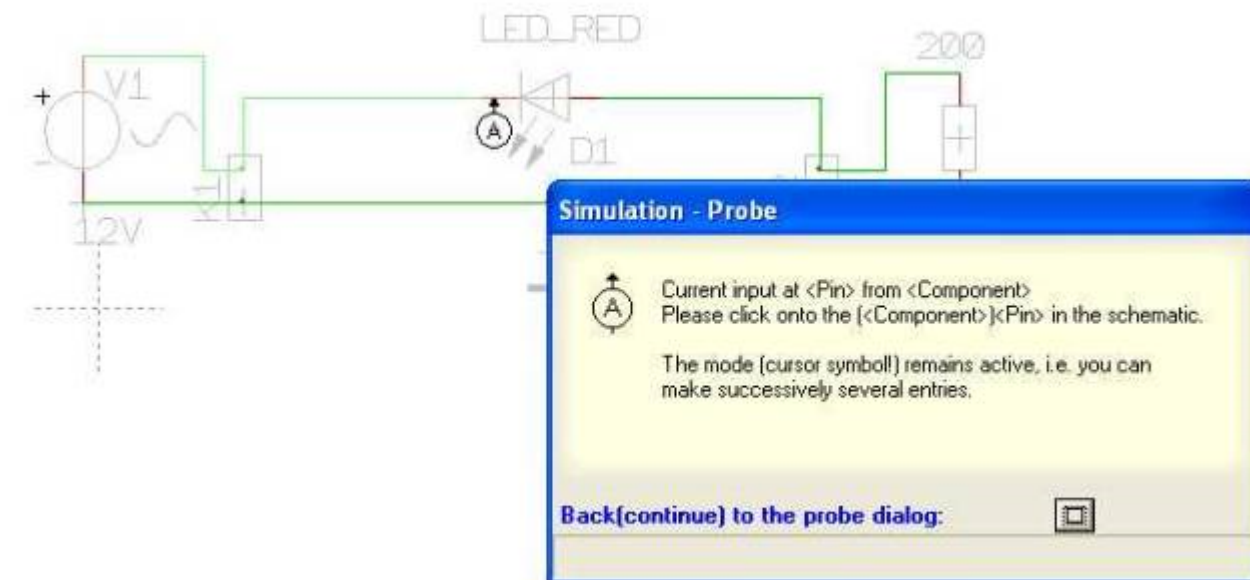
400.00m
 200.00m
 0.00
 0.00 5.00 10.00
 V(out1)

Info [OK]

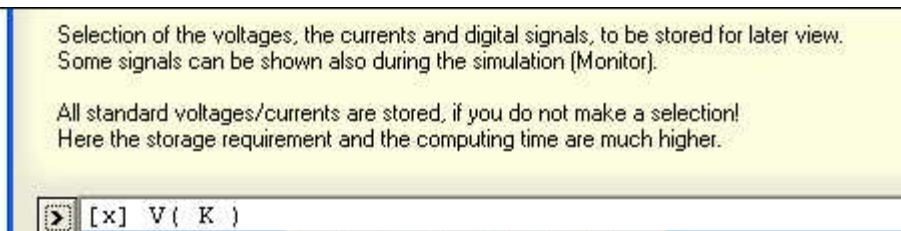
We are interested in the tension (sinus 12V)...



...and in the current through the diode (after selection of "current" in the probe of the main dialog). For the current **not** the signal track must be clicked **M1** but the connection pin itself.

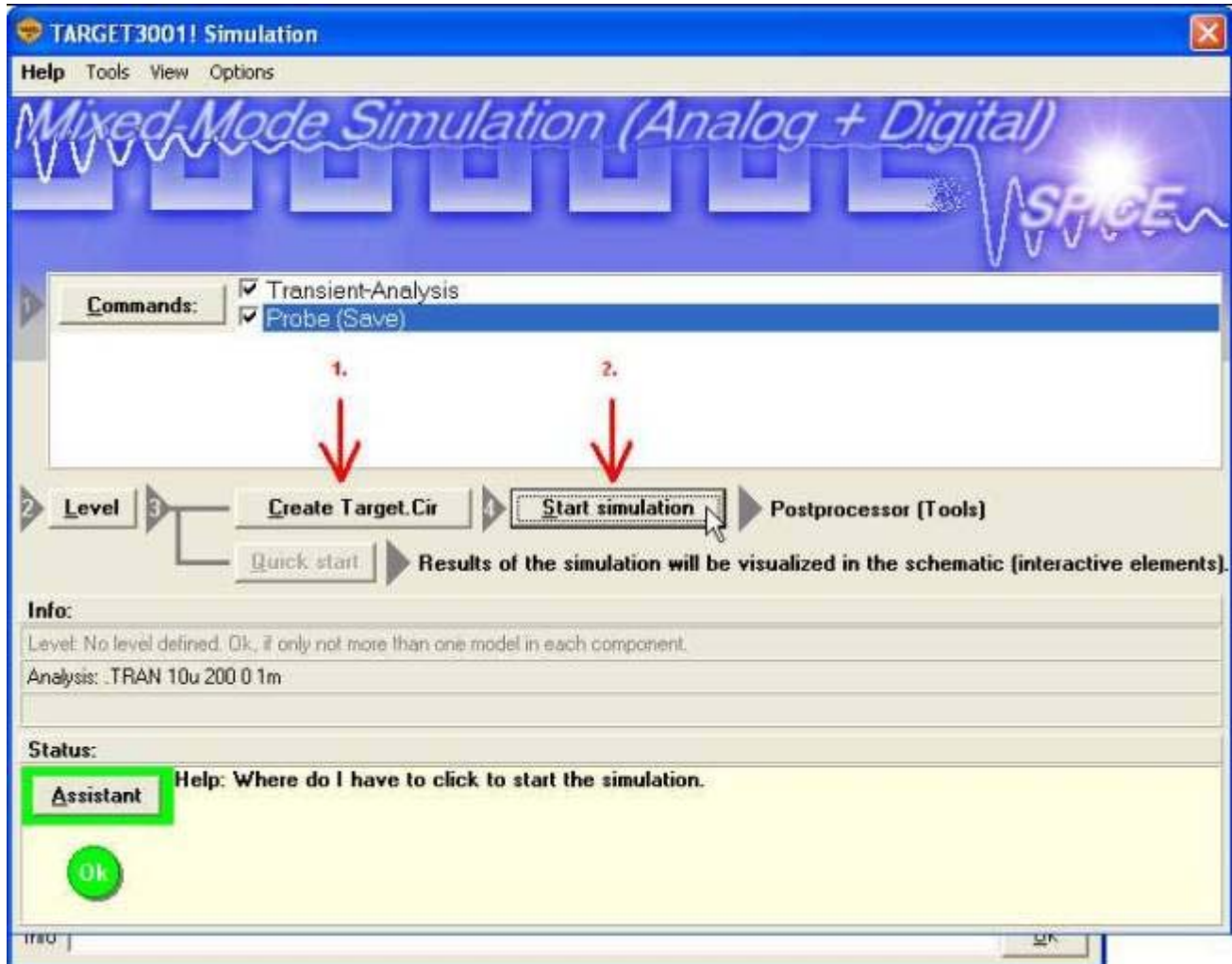


Now click the button "Back (continue) to the probe-dialog".

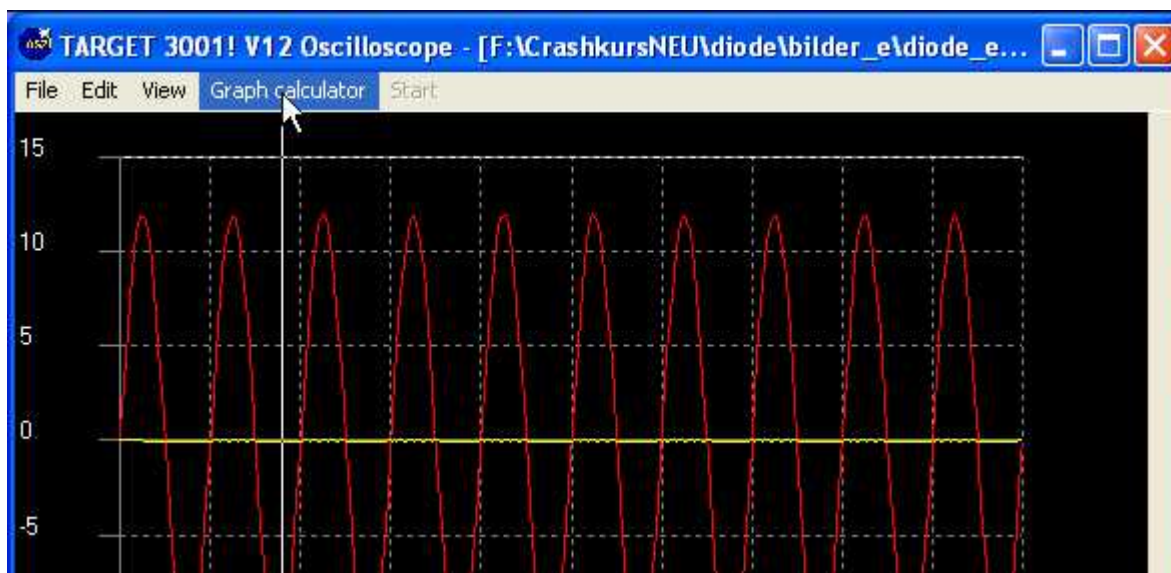


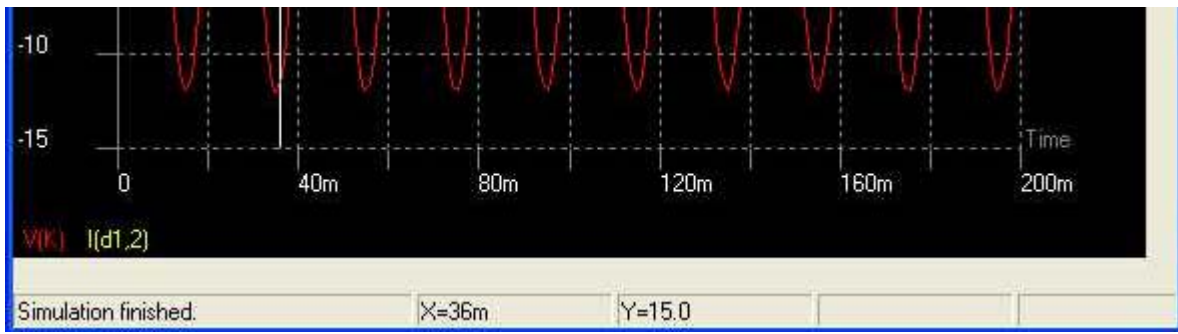


The "immediate screening" (intermediate data are displayed during the simulation process) should be activated by M2 on the corresponding list entry in the probe.

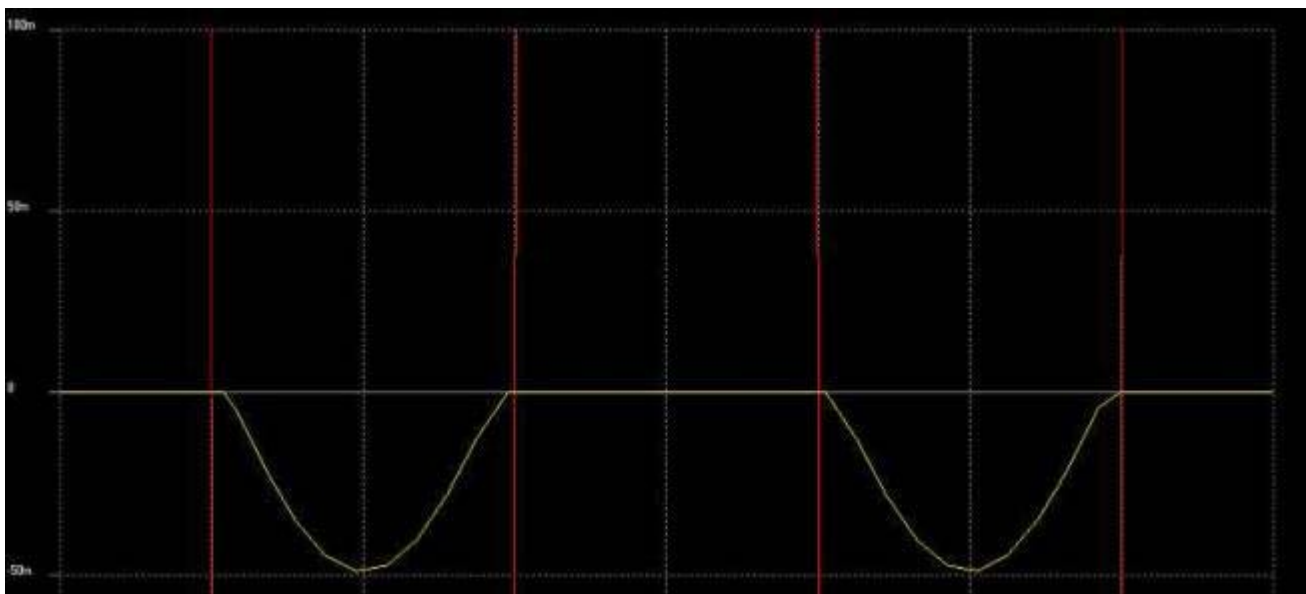
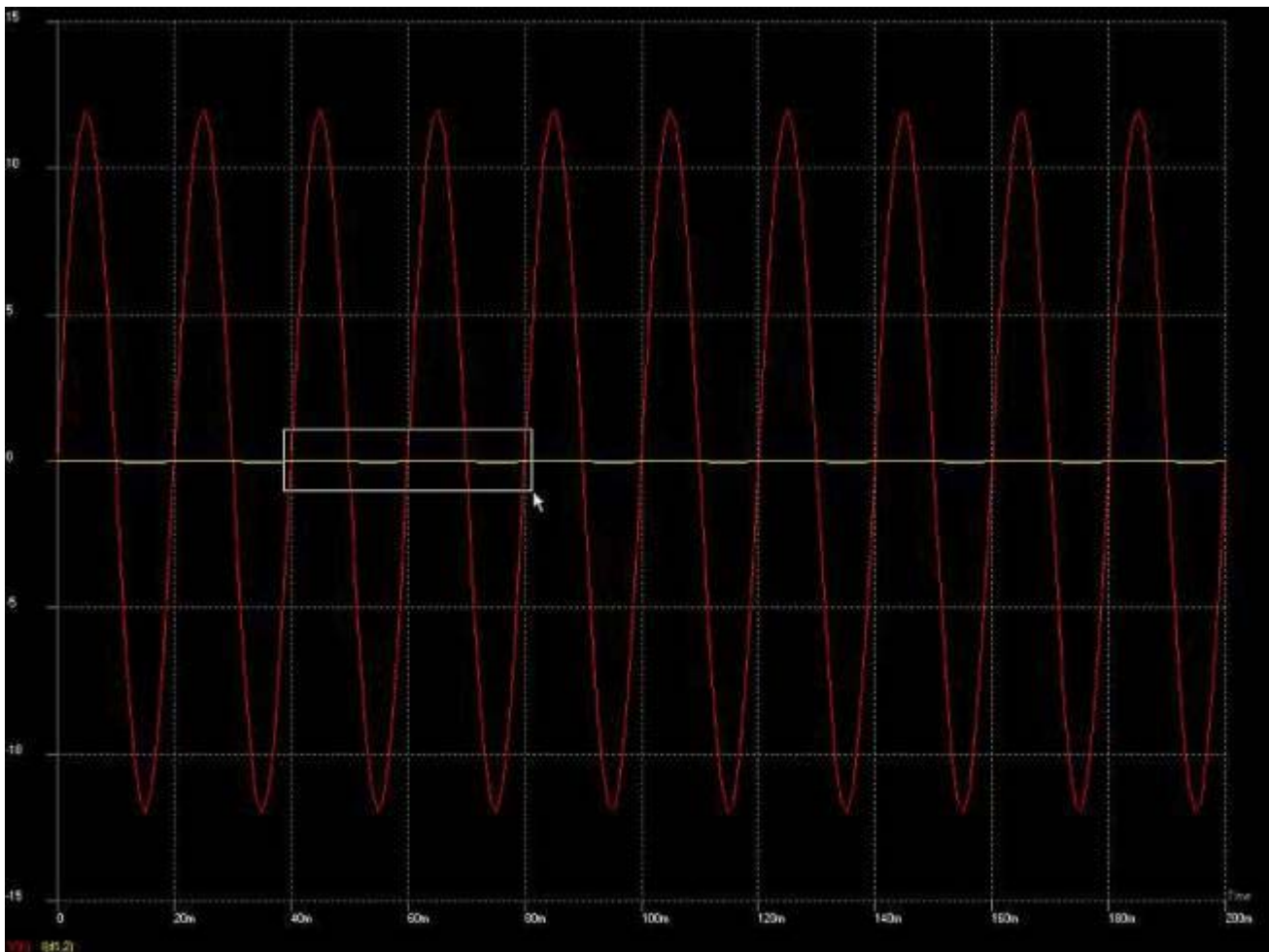


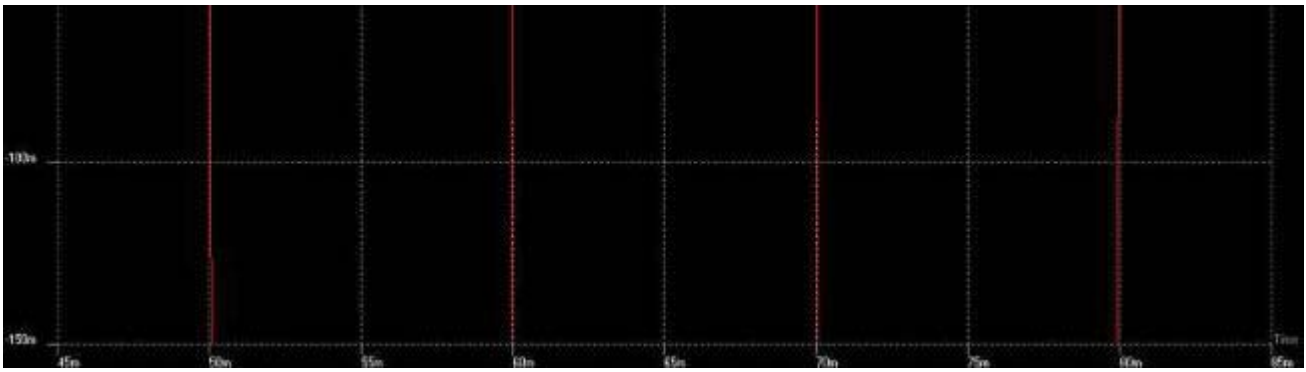
In menu "Graph calculator" you can choose different colors for tension and current and receive:





If we now zoom in and view a section of the graph, we can inspect the course of the tension as well as the current:





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