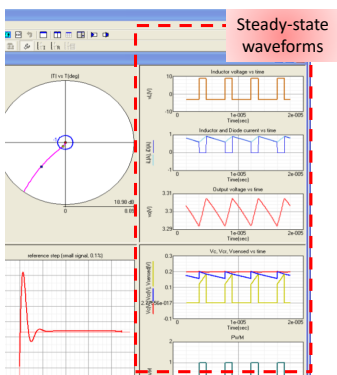


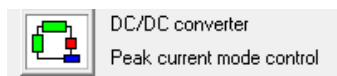
What's new in SmartCtrl 2.1?

Find what's new in SmartCtrl 2.1:



1. Steady State waveforms

Now, SmartCtrl not only provides the Bode plots, Nyquist and transient response, but it adds the steady-state waveforms.



2. Peak current mode control (PCMC)

For every DC-DC pre-defined converter a new control strategy has been added, the peak current mode control.

```

// Buck three stages
R = 100e-6
L = 470e-6
C = 470e-6
RSC = 100e-3
Vdc = 20
Ns = 15

// Filter parameters
Lf = 100e-6
Rf = 0.1e-3
Cf = 1e-5
RSCf = 100e-3

// Damping
zeta = 0.25
Qs = 1.732e-3

// Auxiliary definitions
D = 0.9999
Ds = 0.99999(1-D)
DR = D*(1+1.9*(1-D)) / (1+DR*(1-D))

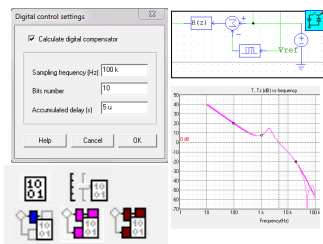
// Transfer functions
H = 1/(R*s + L*s^2)
Hs = 1/(RSC*s + C*s^2)
HSC = 1/(RSC*s + C*s^2)

```

3. Equation editor

An additional feature is now available in SmartCtrl, the equations editor. This built-in function supports the definition of customized plants and sensors transfer functions, through the “design a generic plant” and “design a generic control system” options.

And take a look at the SmartCtrl 2.1 Pro:



4. Digital control design tool

A new digital control module is included in the new Pro version. Key features are the following:

- Digital effects (DEFs) such as sampling frequency, DPWM delays, and rounding effects due to the limited bits number of compensator coefficients are considered.
- New Bode plots considering DEFs are shown.
- Sensitivity analysis of DEFs can be performed.
- The designed digital compensator can be exported to PSIM in z-domain format.

What's new in SmartCtrl 2.1?

The summary of new features is the following:

1. Steady state waveforms

In this new version of SmartCtrl additional results have been added to the graphic panels window. Besides the Bode plots, Nyquist and transient response, the most significant steady-state waveforms are also available. And so, the designer is now able to check the steady state waveforms in SmartCtrl while designing the control loop.

The steady-state waveforms are shown on the right hand side of the graphics panels window as depicted in Figure 1.

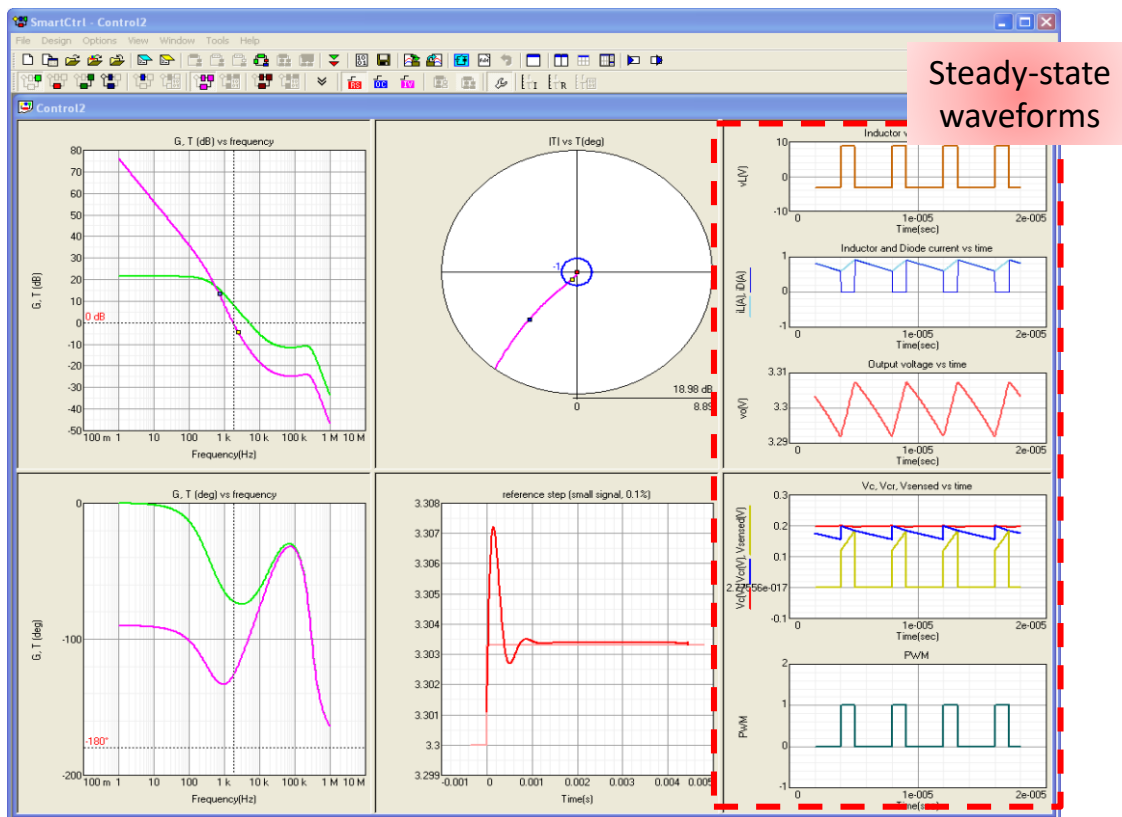


Figure 1 Graphic panels window

2. Peak current mode control (PCMC)

For every DC-DC pre-defined converter a new control strategy has been added, the peak current mode control. Then, this new control strategy can be applied to one of the following converters: Buck, Boost, Buck-Boost, Forward and Flyback.

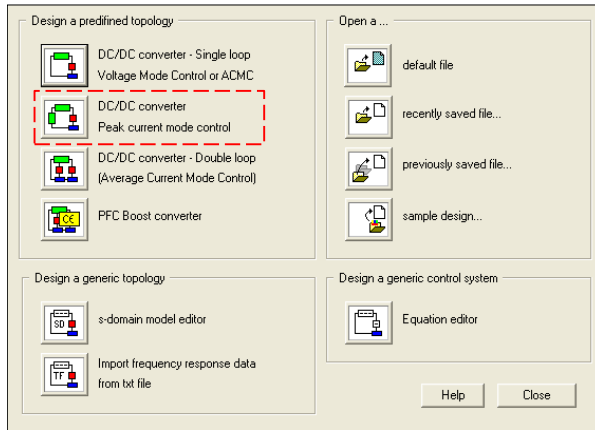


Figure 2 Initial dialog box

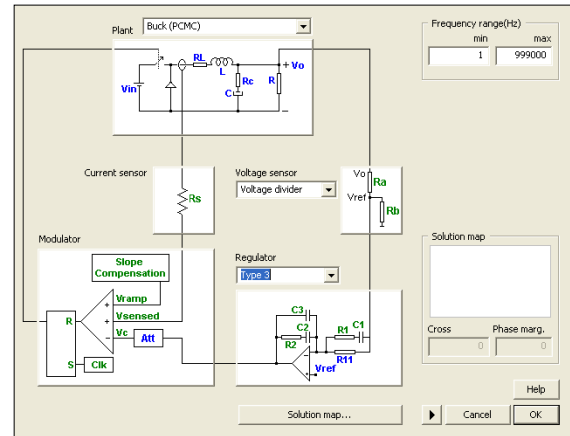


Figure 3 Peak current mode control parameterization window

3. Equations editor

The equations editor is a built-in function of SmartCtrl, and it provides a new input method to define a customized transfer function. It supports two different features:

3.1 Design a generic topology

In this case the equations editor is used to define the plant transfer function of the converter, while the sensor and the regulator are pre-defined ones.

3.2 Design a generic control system

In this other feature, the user is able to define the plant as well as the sensor transfer function, and both of them are introduced through the equations editor.

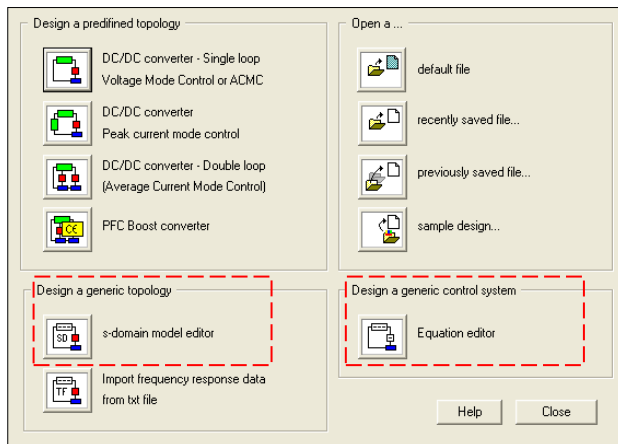


Figure 4 Initial dialog box

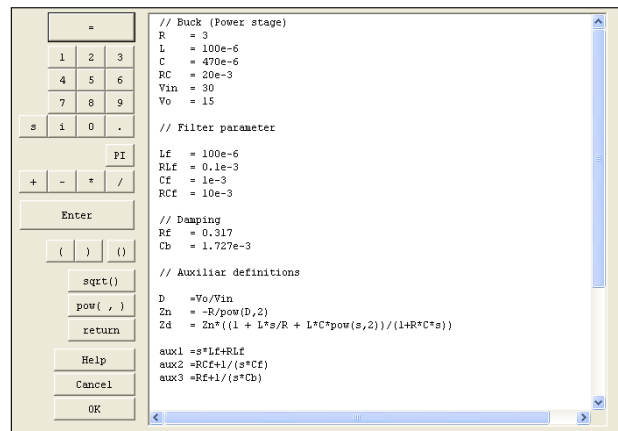


Figure 5 Equations editor