EMTP RV
The reference for power systems transients

The world's most full-featured simulation and analysis program for power system transients

APPLICATIONS

EMTP-RV is suited to a wide variety of power system studies, whether they relate to project design and engineering, or to solving problems and unexplained failures.

▶ **Power system design.**

▶ **General purpose circuit analysis:** wideband, from load-flow to steady-state initialization to time-domain.

▶ Simulation and analysis of power system transients; **lightning, switching, temporary conditions.**

▶ **Detailed simulation and analysis of large scale (unlimited size) electrical systems.**

▶ **Network analysis:** network **separation**, **power quality**, geomagnetic **storms**, **interaction** between compensation and control components, wind generation

▶ **Synchronous machines:** SSR, auto-excitation, control.

▶ Multiterminal HVDC systems.

▶ **Power electronics.**

▶ **Series compensation:** MOV energy absorption, short-circuit conditions, network interaction.

▶ **Transmission line systems:** insulation coordination, switching, design, wideband line and cable models.

▶ **Switchgear:** TRV, shunt compensation, current chopping, delayed-current zero conditions, arc interaction.

▶ **Protection:** power oscillations, saturation problems, surge arrester influences.

▶ **Detailed transient stability analysis.**

▶ **Unbalanced distribution networks.**

THE BENEFITS of EMTP-RV

- **Easy to use interface**
- **Superior modeling flexibility**
- **Advanced simulation engine**
- **Scriptable and customizable GUI**
- **Large range of electrical machine**

- **No more topological restrictions for non-linear elements**
- New analysis methods for:
> Resolution of non-linear elements
> Unbalanced triphased load-flow calculation
> Switching control
> Harmonic steady-state

Simulation options:
- Load-Flow
- Steady-state
- Steady-state initialization
- Time-domain
- Frequency scan

EMTP-RV offers a wide variety of modeling capabilities encompassing electromagnetic and electromechanical oscillations ranging in duration from microseconds to seconds.

EMTP-RV PACKAGE

EMTP-RV
A powerful and super-fast computational engine that provides significantly improved solution methods for nonlinear models, control systems, and user-defined models. The engine features a plug-in model interface, allowing users to add their own models.
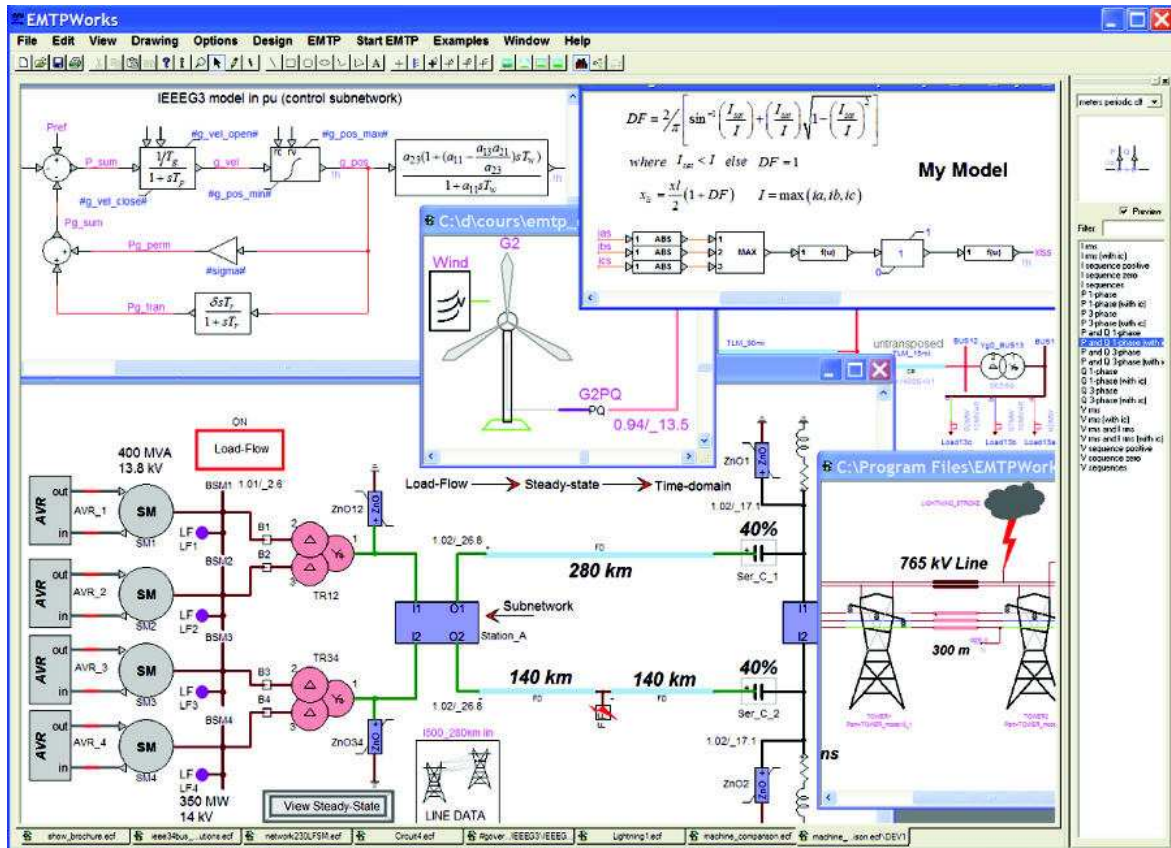
EMTPWorks
An advanced, yet easy-to-use graphical user interface that maximizes the capabilities of the underlying EMTP-RV engine.
EMTPWorks offers drag-and-drop convenience that lets users quickly design, modify and simulate electric power systems. A drawing canvas and the ability to externally program device data allows users to fully customize simulations to their needs.
EMTPWorks can be used for small systems or very large-scale systems.

ScopeView
Provides **waveform visualization** and advanced **mathematical post-processing** capabilities.

The EMTPWorks user interface and sample waveforms

EMTPWorks: Simulation of power systems has never been so easy!

Drag-and-drop simplicity

Need to add a transformer to your simulation?
Just select it from the EMTPWorks device library.

The library contains a wealth of built-in elements, including:
- rotating machines,
- power electronics components,
- compensators,
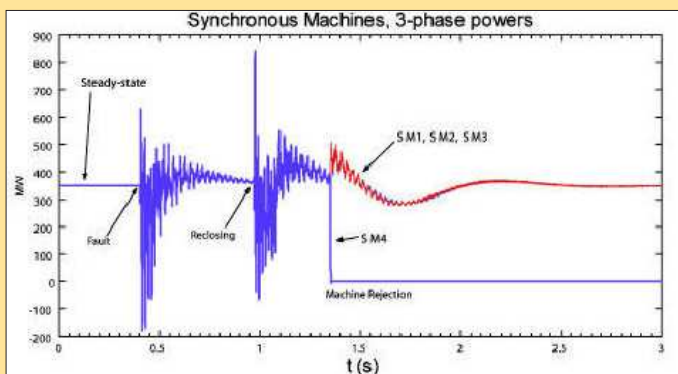- phasors,
- switches,
- meters,
- and much more.

Superior modeling flexibility

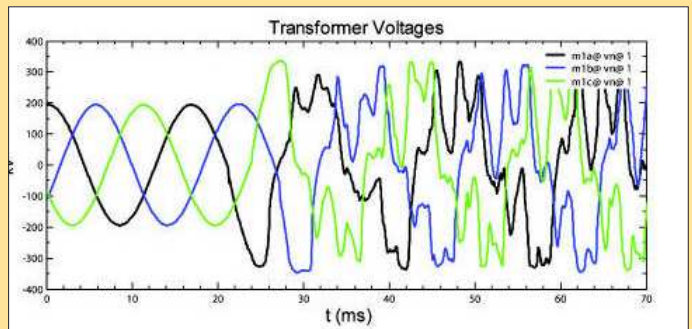**Can't find exactly what you're looking for in the device library?**
Simply add your own user-defined device.

Scripting techniques provide the ability to externally program device data forms and generate the required Netlists.
A **symbol editor** is used to modify and customize device drawings. Scripting techniques are also used for parametric studies.

EMTPWorks also lets the user define any number of **subcircuits** to create **hierarchical designs**.

▲ Synchronous Machines, 3-phases powers

▲ Transformer Voltages

Libraries	Models of equipements
RLC branches	R, L, C elements, PI 3-phase, PQ loads, State-space equations…
Control	Gain, constant, Comparator, Derivative, Integrator, Limiter, Sum, Detector, Delay, sampler, State-space, PLL…
Control of Machines	IEEE Exciters IEEE Governor/Turbines
Flip Flops	D, J-K, S-R, T, universal flip flops
Lines	CP (distributed parameters) FD (=CP+frequency dependency of parameters) FDQ (=FD for the cables) Corona
Machines	Synchronous machine Permanent magnet synchronous machine DC machine Double phase induction machine Asynchronous machine
Meters	Measurement of instantaneous current, voltage and powers
Meters periodic	Measurement of RMS or symmetrical sequence value of current, voltage, powers…
Nonlinear	Nonlinear resistance Nonlinear inductance Saturable inductance ZnO Line Surge Arrester SiO Line Surge Arrester
Sources	Voltage sources Vac, Vdc Curent sources Iac, Idc Lightning current source Controlled current source Controlled voltage source
Switches	Diode Thyristor Airgap Ideal/Controlled switch
Transformations	3-phase to dqo 3-phase to symetric sequence
Transformers	3-phase models built from 1-phase models: DD,YY,Dy,YD,YYD… Topological models: TOPMAG Impedance models: BCTRAN, TRELEG Frequency admittance model: FDBFIT
Advanced	STATCOM SVC Variable load (depending on the Voltage and the frequency)

Simulation examples

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