SYNPLE

Multi-domain system synthesis and simulation made simple

Talking 'bout a revolution...

Developed by IntelliSense to answer the unique needs of the Microsystem and Nanosystem community, SYNPLE is a system-level simulator for multi-domain phenomenon simulations. As a design professional, you always seek new ways to realize your designs and, ultimately, bring them to market. With SYNPLE, you can. This revolutionary tool will enable you to work in multiple domains — simply and without limits.

Expand your horizons

Do your current simulation tools stifle the reach of your imagination? Impose limitations on your designs and work product? SYNPLE will allow you to follow your out-of-the-box vision — and create simulations to match. SYNPLE's advanced element libraries, user-defined elements and expandable architecture will significantly increase your present multi-physical simulation capabilities. As a result, you can explore a whole new design universe and be as creative as you want to be!

System-level simulation, made simple

While SYNPLE's range is wide enough to create complex simulations, its user interface is exactly what the name implies — simple! In fact, if you've ever created a flow chart (who hasn't in this business?), then you'll take to SYNPLE like a fish to water. By relying extensively on the familiar "drag-and-drop" function, rather than arcane interfaces, it's both easy to learn and easy to use.

Elements, unlimited

To further your capabilities, IntelliSense Software ships SYNPLE with an extensive line of comprehensive element libraries for your use. These include analog, digital, mixed- signal, micromechanics, semi-conductor, MEMS and biological modules. SYNPLE's expandable architecture will enable you to expand the libraries by creating customized elements of your own.

| Analog | Digital | Mixed Signal | Semi-conductor |
| Micro-mechanics | MEMS | Neuro-physics | FEA interfaces |
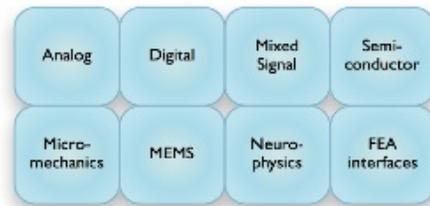
Build from the bottom, up

SYNPLE's bottom-up modeling capability enables you to drag and drop individual elements, such as atomic, compound and device elements, from different domains and wire them up to create complex systems. For instance, you might draw elements from SYNPLE's MEMS library, which comprises atomic elements like beams and plates; compound elements like serpentine springs and comb drives, and device elements like switches, accelerometers and gyros — to create your own complex systems from the bottom up.
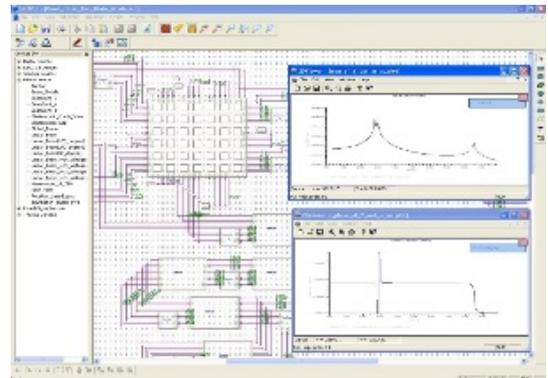
AC Simulation of a MEMS tunable band pass filter assembled from basic elements such as beams, plates, comb-drives and anchors.
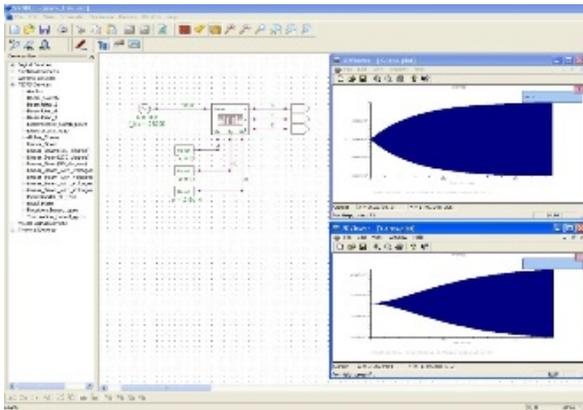
SYNPLE ships with many real world compound elements that will enable to you to quickly test your concepts. Shown here is the classic startup transient response of a vibratory gyro.

Develop from the top, down

Is top-down modeling a more desirable capability for your needs? If so, then SYNPLE makes that simple as well — allowing you to import your existing finite element models and combine them into new, more complex systems.

FEA model → System Model Extractor (SME) → Accurate N-DOF SYNPLE model
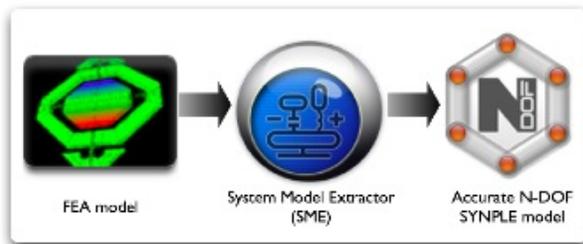
System model extractor tools built into FEM analysis tools allow you to create accurate N-DOF (*n* degrees of freedom) system models that can seamlessly incorporated in SYNPLE.

The seamless integration of System Model Extractor (SME) with SYNPLE is a powerful combination that allows you to create accurate N-DOF device level *black box* models that fully capture the dynamic and harmonic responses of even the most complex of MEMS devices. Our tests have shown a 100-1000x improvement in speed in performing dynamic analyses compared with traditional FEA.

Speed King

FEA Dynamic	70 hours
FEA Quasistatic	4.5 hours
SME - SYNPLE	30 seconds — 100-1000x speed boost
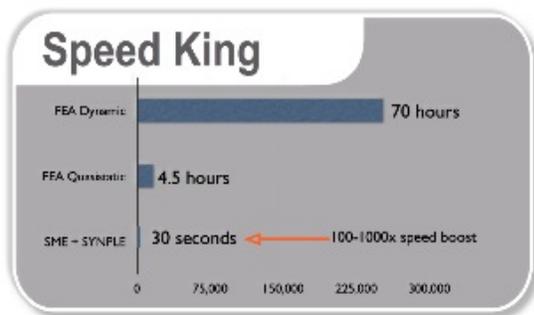
In our tests a combination of SYNPLE and SME can speed up transient/dynamic calculations by 100-1000 times. Calculations that can take hours or days in FEA can now be solved in seconds.

Maximize creativity, time and savings

First and foremost, SYNPLE enables you to explore a large design space in a short amount of time — which maximizes your time and creativity. To save time further, it allows you to funnel, and quickly whittle down, a large number of design options.

And to minimize your manufacturing costs, SYNPLE makes it possible to understand the ultimate impact of your design parameters on manufacturing yield.

Enjoy maximum creativity at minimum time and cost — it's that SYNPLE!

Feature highlights

Full range of analysis

• Small signal analysis • Large signal analysis
• Transient analysis • Steady state analysis
• Sensitivity analysis • Parametric analysis
• Monte Carlo analysis

Large Element library
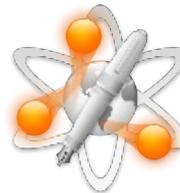
Electrical Elements • Digital and Logic Elements • Mixed Signal Elements • Switched capacitor elements • Thermal Elements • Micromechanical elements • MEMS elements • Neurophysics elements

Other features

• Easy to learn, easy to use interface

• Wide range of solvers

• Seamless support for N-DOF FEA based models

• Perform accurate dynamics/transient analysis 100-1000x times faster than FEM based models

• Integrate MEMS FEA models with control circuitry and digital logic

• Accurate Analog/Mixed-Signal analysis of MEMS

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