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AI Design Assistant Takes Power Converter Designs From Specs To Simulation In Minutes

Frenetic Electronics, the company that offers a web-based custom magnetics design platform, has launched Frenetic AI, an AI-powered assistant that helps engineers design power converters. It recommends a converter topology based on user constraints and automatically generates electrical schematics and simulation files (LTspice and PLECS). Frenetic AI also suggests suitable off-the-shelf or custom magnetics.

As Chema Molina, founder and CEO of Frenetic, explains, "Frenetic AI turns a complex, multi-hour design process into a seamless, intuitive workflow. Engineers can move from specs to simulation in minutes. Basic users receive full magnetic specs automatically, [while] advanced users can deep-dive into detailed customization and simulation options."

Frenetic AI is currently available as a free Basic version which has been beta-site tested by thousands of electrical engineers around the world. In addition, a PRO version is offered that includes premium features such as off-the-shelf component suggestions and additional design insights. Later this month more features will be added such as new topologies, planar transformer design and PLECS integration. Standard pricing for the PRO version is 200 Euro/month.

Discussing the development of Frenetic AI, Molina recalls how his company spoke with power supply engineers to understand their design processes and to see where they are investing their time. In doing so, they came up with a process that both power supply companies and their users go through. The result is an AI-based design tool that performs those time-consuming tasks—generating schematics, running simulations, selecting components and generating a BOM. With Frenetic AI, engineers can "use our technology and AI will do that for you," says Molina.

While the tool can be used by power supply engineers—the experts—it can also be used more widely. "We are democratizing the market for those who don't have power electronics expertise," explains Molina.

Based on the user's specifications, the tool can either search for-and-find off-the-shelf (OTS) power supplies or suggest power supply topologies and then design and simulate those circuits. In addition, it will design and simulate the required magnetic components (see the figure). One caveat is that the tool does not currently create a pc-board layout, as this requires a level of sophistication beyond the current AI technology, according to Molina.

Frenetic AI can integrate with Frenetic Magnetic Simulator for advanced magnetic component design, or can be used as a standalone module. The company has also announced significant upgrades to Frenetic Magnetic Simulator, its cloud platform that allows engineers to simulate and design high-frequency inductors and transformers with up to 95% accuracy.

The original platform delivers advanced modeling of copper and core losses, the superposition of ac signals with high-frequency components and material and core selection based on the application's needs. Latest innovations include a machine-learning-based model for calculating foil winding losses. The new version of Frenetic Magnetic Simulator has been trained on 5,000 FEM simulations across a wide range of designs, and delivers 12% median relative error, with millisecond response times.

Adds Molina, "Frenetic Simulator is used 8 hours a day by professionals of magnetic design. The launching of the multiple operating conditions simulation has been another big step to boost the capabilities of optimizing the magnetics never seen before."

He continues, "Frenetic is committed to making magnetic design part of a broader, more connected design process. We're currently working with leading simulation software providers to allow engineers to seamlessly export magnetic designs into full FEM environments for advanced validation. The user benefits from reduced manual modeling effort, a faster transition from conceptual design to FEM-level verification, and better alignment between simulation layers."

Frenetic has prepared Webinar clips and demo videos and users can access live demo environments on request. Also see the Frenetic AI use cases page for an introductory video on Frenetic AI and see the Frenetic AI page to start a design. For more information, contact the company.

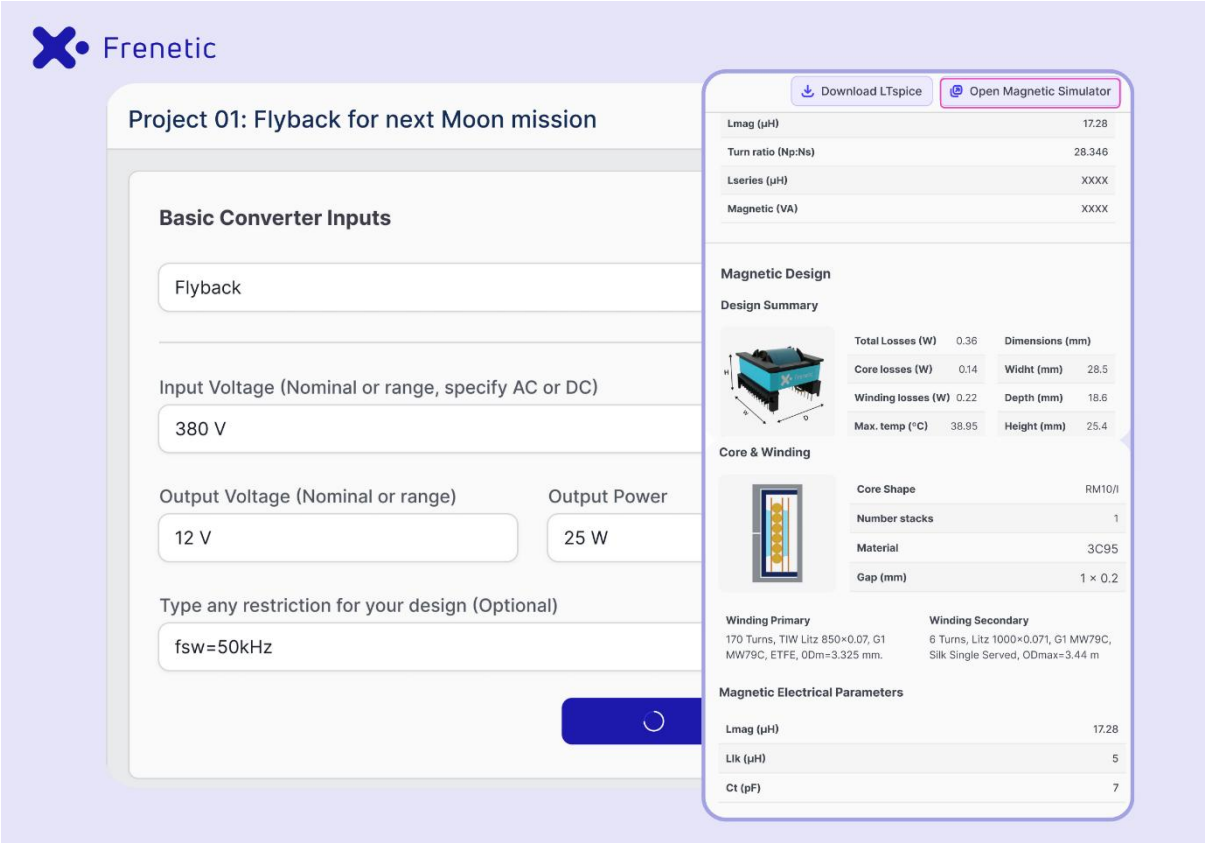

Figure. With Frenetic AI, users enter electrical specs for their power supply project. The tool can then either search for an off-the-shelf power supply, or suggest a power supply topology. In the latter case, Frenetic AI will create the power supply design, automatically generating a schematic, BOM, and simulation files, and then running simulations. The simulation files are LTspice or PLECS. Frenetic AI also suggests suitable off-the-shelf or custom magnetics.