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STANDEX

Smart Grid & Metering Magnetics

Your project, powering a smarter grid

StandexElectronics.com

Table Of Contents

Energized for Excellence	03
Charged for Success: Where You'll Find Standex Power Magnetics	07
Power Magnetics	10
Planar Magnetics	13
Why Standex Leads the Charge in Custom Power Magnetics	15
Power Plays: Smart Grid Success Stories	19
Explore Our Extensive In-House Capabilities	23



Energized for Excellence

Power magnetics engineered for rapid data transmission, robust energy management, and precise control within the smart grid infrastructure.

RUGGEDIZED AGAINST OUTDOOR CONDITIONS

Outdoor utility meters are subject to deep freezes and sweltering heat. You'll need power magnetics exceptionally ruggedized to withstand a broad spectrum of weather conditions. From potting and waterproofing to withstand rain and flooding, to design features that defend against dust and wind, today's smart meters need to remain operational regardless of environmental stresses.

DESIGNED TO LAST DECADES IN THE FIELD

Power magnetics for smart grid applications don't just need to survive today — they need to operate in equipment that lasts for years.

Robust design standards that test durability under long-time thermal stress and environmental conditions, high-quality insulation materials that resist aging and degradation, and advanced heat dissipation strategies are smart grid must-haves.





HIGH POWER EFFICIENCY

Smart meters aren't just about measuring electricity usage; they're about innovating a smarter, more responsive, and efficient energy system. To support an array of intelligent features, such as real-time energy consumption monitoring, remote control capabilities, and integration with renewable energy sources, these devices require a new level of efficiency.

TAMPER-RESISTANT DESIGNS

Smart meters face more than inclement conditions — they're also prime targets for energy theft. Power poachers take advantage of design weaknesses to draw free electricity, racking up [\\$6 billion in annual losses across the industry](#).¹ Power magnetics used in smart grid technologies need to serve as their own security guard.

1. Deloitte, "Using Analytics to Crack Down on Electricity Theft": <https://deloitte.wsj.com/cio/using-analytics-to-crack-down-on-electricity-theft-1385960523>

From watches to homes, everything is getting “smarter” — including the electrical grid. The smart grid demands a new level of system uptime to accurately monitor, control, and manage granular power needs remotely. When success relies on data accuracy and two-way communication between a meter and a utility company, reliable power magnetics keep information and electricity flowing smoothly.



Charged for Success: Where You'll Find Standex Power Magnetics

SMART GRID MONITORING

Power magnetics are the backbone to granular smart grid control and monitoring. These components facilitate the smooth and precise flow of electricity — and therefore the data that makes up the “brain” of intelligent systems.

SMART REVENUE MONITORING

Billing and resource management requires reliable power magnetics in order to collect and transmit usage data. Blips aren’t just inconvenient — they degrade accuracy and drain revenue. Robust, dependable power magnetics sustain the crystal-clear, uninterrupted transmission smart utilities need to support accurate billing and dynamic pricing models.

MICROGRID CONTROLS AND DISTRIBUTION SYSTEMS

Balance energy generation, storage, and consumption to support the needs of smaller, self-sufficient energy footprints. These systems, designed to operate both independently and in conjunction with the main power grid, rely on the sophisticated management capabilities of power magnetics. Regulate voltage, direct current flow, and shore up stability across diverse energy sources.



ENERGY STORAGE SYSTEMS

Optimize charge and discharge cycles and safeguard the integrity of stored energy. Highly efficient and resilient power magnetics support immediate responses to fluctuating power needs while bolstering system longevity.

ENERGY HARVESTING

Power magnetics are the architects behind the seamless conversion of ambient energy into electrical power. By harnessing energy from a system's surroundings, they bridge the gap between potential and usable power, contributing to a more sustainable energy landscape.



Power Magnetics

POWER TRANSFORMERS

Power transformers in smart grid applications serve as crucial conduits for efficient energy distribution, stepping voltages up or down to meet the network's demands. For smart grid product manufacturers, these transformers need to be highly reliable and capable of handling variable loads with minimal losses.

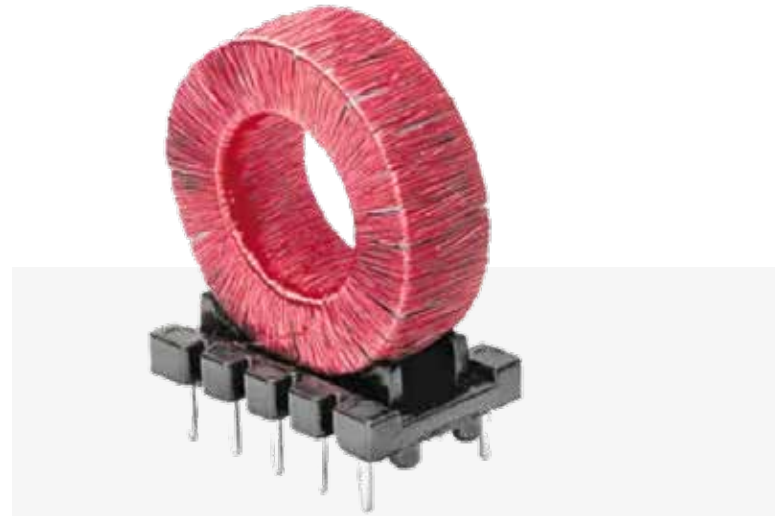


SMPS TRANSFORMERS

Develop power supplies that are not only smarter, but capable of handling a wide range of input voltages. Essential for the fluctuating nature of power generation and consumption in smart grids.

CURRENT TRANSFORMERS

Innovate solutions that ensure precise current measurement, critical for fault detection, load monitoring, and control within the grid.



CHOKES

These critical components must exhibit exceptional electrical performance, capable of handling high currents and suppressing electrical noise, safeguarding the integrity of sensitive electronic equipment.

ROGOWSKI COILS

Rogowski coils, coupled with advancements in digital IC measurement techniques, measure high currents with exceptional accuracy. Standex Electronics stands out in its capability to produce coils tailored to particular application needs, bolstered by our engineers' vast expertise in collaborating with clients on customized solutions.

POWER INDUCTORS

Maintain stable inductance under varying load conditions. Smart grid power inductors effectively manage surges and spikes, while safeguarding sensitive components from potential damage and extending product lifespan.

CUSTOM-WOUND ASSEMBLIES

We don't filter possibilities by what's easiest — we find the best solution for your project. That means we often explore custom ideas and new methods first, backing your idea with power magnetics as innovative as your product.





Planar Magnetics

Conventional wire-wound components once dominated the field, but planar magnetics are making new in-roads for smarter technologies.

COMPACT, LOW-PROFILE DESIGNS

The push towards more compact and integrated smart grid systems demands components that can fit into tighter spaces without sacrificing performance. Planar designs flatten windings onto a printed circuit board (PCB) so components can squeeze into a wider variety of design configurations.

SUPERIOR THERMAL MANAGEMENT

Smart grid components are often subjected to continuous operation and fluctuating power levels, leading to variable thermal loads. Efficient heat dissipation prevents overheating, reduces the risk of failure, and bolsters consistent performance across changing conditions.

HIGH POWER DENSITY

As smart grids handle increasingly complex loads and distribute power across diverse networks, planar designs deliver power efficiency at 99%+ in a much smaller package.

MAKE ROOM FOR SMART TECHNOLOGIES

Smaller power magnetics free up valuable space within devices, leaving room for even more sophisticated data-transmission and processing technologies. By reducing the footprint of power magnetics, you can design products that fit the future of intelligent decision-making and agile energy distribution.



Why Standex Leads the Charge in Custom Power Magnetics



REFINE YOUR TECHNOLOGIES WITH RAPID-FIRE ITERATIONS AND REAL-TIME COLLABORATION

Successful smart grid projects share one quality: the speed of deployment. Manufacturers in this sector don't have years or decades to implement new technologies — they're needed now.

We're experts in delivering rapid-fire iterations through tight collaborations. In smart grid technologies, agility and adaptability are key. Whether remote or in-person, we specialize in getting ideas, design changes, prototypes, and final products into your hands swiftly.

ENVIRONMENTAL PROTECTION FOR OUTDOOR APPLICATIONS

We're brimming with creative strategies for potting, casting, and other protective techniques to safeguard your magnetics against harsh environmental conditions. These advanced methods deliver reliable performance regardless of exposure to moisture, temperature extremes, or other unexpected elements.





STRONGER SUPPLIER RELATIONSHIPS FOR SMARTER PRODUCTS

Our global relationships extend beyond a single country or vendor. Tap into our expansive sourcing and manufacturing footprint that's resilient to regional challenges. This global presence backs your company with a reliable supply chain and opens the door to more customized opportunities. With production capabilities across different continents, we can navigate around local disruptions, ensuring that your project timelines are met without compromise.

INSULATION AND SHIELDING EXPERTISE

Our team brings unmatched expertise to the table through a rigorous understanding of UL/IEC standards. These standards set the bar for the performance of electrical products, from minimizing electromagnetic interference (EMI) to overall system safety. Our approach to insulation and shielding doesn't just aim to protect against operational disruptions, but also extends the service life of components.

CUSTOM APPROACHES TO UNCONVENTIONAL PROJECTS

Recognizing that no two smart grid applications are the same, we tailor our magnetic solutions to meet the precise needs of each project. This customization extends beyond just the technical specifications to include form factors and integration requirements, fitting our magnetics components seamlessly into your overall system design.



Power Plays: Smart Grid Success Stories





Smart, Secure, and Tamper-Resistant

Mission: Flyback transformer for a smart power meter

A premier smart meter manufacturer came to Standex Electronics with an urgent problem: bad actors were exploiting certain design weaknesses to steal power.

- Using creative technologies, like 3D printing, we expanded the number of testing prototypes to more than conventional methods allow. A wide array of ultra-fast samples allowed the client to see how different options fit inside their housing.
- We took on the role of an electricity thief, validating the security of our designs using their same nefarious strategies.
- Through close collaboration with the client, we could try new ideas almost immediately, cutting down the traditional weeks-long-wait for samples.



Powering Strategic Manufacturing

Mission: Move manufacturing of a planar transformer assembly to a new geographic region

Electronics manufacturers expand the resiliency of their supply chain by tapping into the benefits of new geographic regions.

We helped this leader in smart microgrid controls transition production into North America.

- Redesigned the client's program from the ground-up with a design-for-manufacturability mindset.
- Deployed significant CapEx investments to introduce modern, semi-automated potting techniques.
- Wrapped our in-house smart grid testing capabilities into the program, from corona noise analysis to advanced high-voltage testing.

Calibrating the Details

Mission: Improving power transfer and sensing solutions no matter the design phase

Sometimes your next big idea isn't ready with all the details. Clients often invite us on-board for experimental projects early in the ideation process. **With only a few details, like core type and a basic diagram of the mechanicals, we helped this client turn a sketch into a solution.**

- Experimented with several heavy-wire winding configurations that would fit into the client's tight envelope.
- Found innovative ways to trim down the product footprint. We tested several materials for the potting cup, with various viscosities and thermal properties.
- We became the client's new go-to partner for testing new breakthroughs. Instead of waiting until they have a fully fleshed-out technical proposal, they come to us early on to catapult ideas from concept to reality even faster.

EXPLORE OUR EXTENSIVE IN-HOUSE CAPABILITIES

- High-Power Litz Wire Inductor and Transformer Design
- Planar Transformer and Inductor Design
- High-Reliability Industrial
- Ansys Maxwell 2D/3D High-Frequency Magnetic Simulation
- Potting Under Pressure
- Vacuum Encapsulation
- AS9100 - ITAR Certified





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