

DESIGNING TO STANDARDS SIMPLY PRODUCES STANDARD RESULTS

By Tim Wells

The smart grid is changing the way we power our lives. Latching relay companies who understand how to design products that meet international standards yet exceed expectations will provide a long term, high quality solution for meter manufacturers, as well as long term financial savings for energy producers.

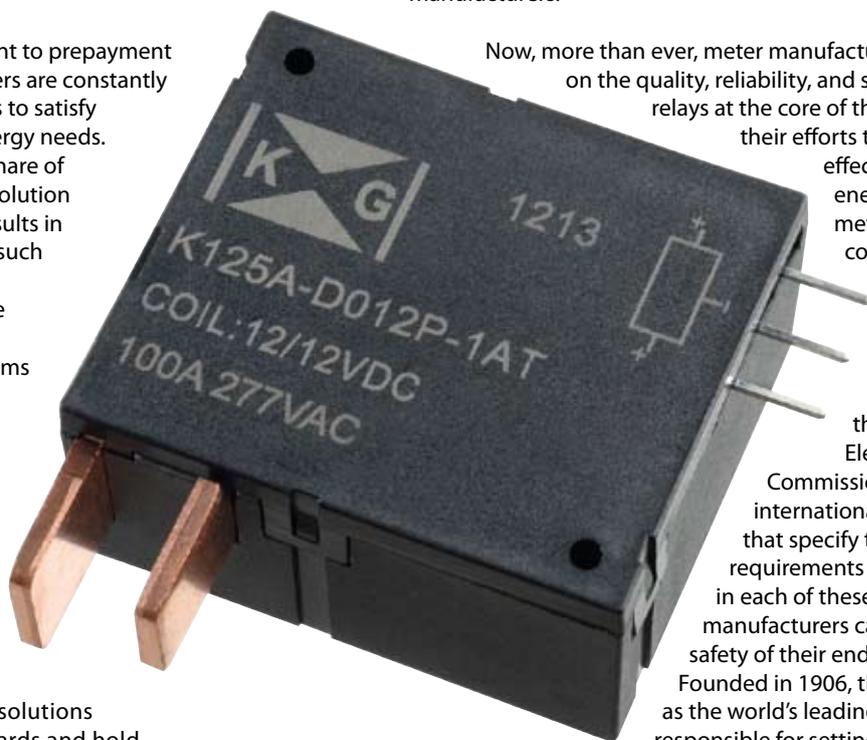
From demand side management to prepayment meters, today's energy producers are constantly developing more efficient ways to satisfy the world's ever expanding energy needs. Yet evolution isn't without its share of trials and tribulations. Rapid evolution across an industry generally results in early headaches and setbacks, such as in aviation, architecture, and manufacturing. Whether it's the recently produced Boeing 787 Dreamliner with battery problems or a structurally inept garment factory in Bangladesh, the need for standards to ensure product and public safety is unquestionable.

Now as smart meter technology moves through its evolutionary cycle, both latching relay and meter manufacturers are faced with developing high quality solutions that meet international standards and hold up to the demands of the market. The jury may still be out on whether demand side management (DSM) is a positive service feature for energy consumers. Yet, it is apparent that as emerging economies become more energy dependent, energy producers will need to leverage smart meter technology to provide energy safely and economically. And while international standards ensure safety, they alone do not ensure high quality or effective pricing. Companies that understand how to design products that meet international standards yet exceed expectations will provide a long term, high quality solution for the meter manufacturers, as well as long term financial savings for energy producers. This type of front-end, proactive thinking is paving the way for a new generation of latching relay and meter base assembly solutions.

INTERNATIONAL STANDARDS SHAPE LATCHING RELAY TECHNOLOGY

Leveraging the advantages of DSM and prepayment meters is at the heart of next generation energy management. DSM gives energy producers greater flexibility in managing supply through the reduction of demand during peak hours, energy savings through

individual load switching, accurate billing of consumers and the ability to disconnect users refusing to pay or abusing the use of electricity. This ability to disconnect power is possible because of the use of latching relays inside the meter. As a result, the latching relay has now become a key product feature for many meter manufacturers.



Now, more than ever, meter manufacturers are focusing on the quality, reliability, and safety of the latching relays at the core of their meters. In

their efforts to provide a cost effective solution for energy producers, meter manufacturers consider the relay's ability to handle over-current, short circuits, and loads over time. Fortunately, the International Electrotechnical

Commission (IEC) sets international standards that specify the minimum requirements for latching relays in each of these areas so that meter manufacturers can guarantee the safety of their end-state products. Founded in 1906, the IEC has served as the world's leading organization responsible for setting standards for electrical and electronic technologies.

In coordination with its sister organization, the International Organization for Standardization (ISO), IEC works with international, governmental, and nongovernmental organizations to develop international standards, technical specifications, and technical reports that guide the design and manufacturing of a wide range of products. The two most relevant standards that apply to latching relay technology are IEC 61810-1 and IEC 62055-31.

IEC 61810-1 applies to electromechanical elementary relays (i.e. non-specified time, all-or-nothing relays) that are used in equipment. This standard defines the basic functional requirements and safety related aspects for applications in all areas of electrical engineering or electronics, including medical equipment, information technology and business equipment, telecommunications, and transportation. While IEC 61810-1 serves as the guiding standard for most latching relay applications, IEC 62055-31 raises the bar for latching relays used specifically for static watt-hour payment meters mounted indoors. This standard directly addresses the requirements for over-current, short circuit, and reliability.

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One of the features of IEC 62055-31 is the load switching performance requirement. This specific requirement is linked to a utilization category chosen by the smart meter manufacturer or designated by the energy producer. As an example, most smart meter manufacturers now require Utilization Category 3 (UC3) compliance to IEC 62055-31 for the latching relay used inside their meter. Previously, manufacturers only required UC1 or UC2. This higher requirement means that the relay (and consequently, the meter) must withstand higher short circuit or over-current events. Some latching relay manufacturers choose to partially comply (and assume the attendant risk) in order to save relay costs, by completing only the short circuit portion of the requirements and not the entire test suite.

While partial compliance might save a little bit of money, it does compromise the relay's ability to withstand repeated short circuit or current overload events. Additionally, the possibility of greater liability exists due to increased potential for a field failure, which would require field service and, consequently, added costs. This problem increases the variable costs for energy producers who often recoup these costs by monetarily penalizing their meter manufacturer. Thus, it pays to be proactive.

SMARTER DESIGNS YIELD LONG TERM GAINS

American business schools are known for using a popular quote from hockey legend Wayne Gretzky in teaching strategy to their students. Gretzky is famous for stating that he always skated to where the puck was going to be rather than where the puck had been. His natural intuition made him one of the greatest players in his sport, just as smart meter manufacturers today are attempting to set themselves apart in a market that has yet to fully emerge. Yet, smart meter manufacturers aren't doing it alone. In partnership with latching relay manufacturers, they are collaborating to build reliable, cost effective products that address the needs of diverse markets.

Latching relays designed for the way energy has been produced and distributed will not serve all purposes for the way energy will be produced and distributed in the future. As we are learning from emerging markets in Asia, India, and Latin America, the demands on a smart meter change as the use of prepayment meters increases. Now relays that have been designed to switch (or disconnect) less than a handful of times in their lifetime, may now be required to switch on a daily, weekly, or monthly basis. Issues brought on by magnetic tampering, shock damage, and over-current events have greatly altered the way latching relay manufacturers must think through their designs for use in a smart meter. This shift in thinking is also forcing meter manufacturers to partner more closely with latching relay manufacturers to build solutions that fit the future state use rather than solutions designed to fit the current state of energy distribution.

Current international standards require the same tests for all latching relays used for the same purposes – albeit, there are

differing levels of testing for each usage purpose. So why then do some latching relays perform better than others? Foresight and collaboration. The latching relay can be the most expensive component inside the smart meter. Its quality, reliability, and safety are integral to the smart meter's functionality. Hence, it is becoming important for latching relay manufacturers to have the ability to produce a more value-added, integrated solution (i.e. the complete production of a meter base assembly). In doing so, they produce a more cost effective and efficient solution that has been fully tested within the end-state meter base assembly.

On the other hand, failing to proactively address the requirements of the entire meter may contribute to performance issues. Considerations regarding creepage, clearance, shock absorption, magnetic immunity, and mechanical/electrical endurance, if not adequately addressed, will ultimately decrease overall performance of the meter. The resulting added expenses and burdens of time are simply unnecessary and can be reduced when the relay and meter manufacturers collaborate earlier in the process. Earlier planning and collaboration allows both parties to meet the ultimate usage requirements for the relay, rather than simply relying on the relays to pass international standards as a confirmation of end-state product reliability.

KG TECHNOLOGIES: SOLUTIONS FOR THE FUTURE OF ENERGY MANAGEMENT

KG Technologies, Inc., a leader in switching solutions for the world's energy management market, prides itself on developing reliable latching relays and ensuring dependable manufacturing and distribution of its innovative products. Beyond relays, KG Technologies offers highly integrated value-added assemblies effectively streamlining its customers' supply chain and reducing overall the cost of procurement. The Cotati, California-based company looks beyond the current needs of the market to develop solutions that help the world switch to a greener tomorrow. To do so, KG Technologies focuses on building key relationships at both ends of its value chain and designing innovative products like the new K125 latching relay that raises the bar for quality and value.

KG Technologies believes in the importance of building open and honest relationships with its customers. As the company continues to look ahead to the future needs of the smart energy market, it recognizes that its customers need more than a latching relay supplier, but rather a thought partner who builds solutions that reduce failure rates, logistics costs, and lead times.

The company is building relationships in the market around these key objectives, which enables it to remain agile and provide flexible design solutions for the evolving smart meter market. It is through cultivation of these customer relationships that KG Technologies achieves its core customer service motto of working with you so that their products work for you. ■■



ABOUT THE AUTHOR

For over a decade, Tim Wells has been working at companies at the forefront of innovative technologies, from where he has brought his expertise in leveraging customer relationships to enhance product design to KG Technologies. Now as Vice President of Engineering, he is cultivating global customer relationships to design innovative solutions for the smart meter market.

ABOUT THE COMPANY

KG Technologies, Inc. is a leader in switching solutions for the world's energy management market. We have developed patented latching relay technology for the smart grid that changes how the world handles high current, high voltage switching. Utilizing one of the largest, state of the art factories in the industry, we ensure high volume production, timely delivery and competitive pricing.

www.kgtechnologies.net