

Powerlines Returns...

We'd just like to say "Welcome Back!" The popular TEAL Electronics newsletter *Powerlines* has returned.

TEAL started the newsletter in the early 1990s, and over the next several years published regular editions bursting with informative articles about our company, employees, and technologies, power quality in general, and our customers and suppliers.

Well, our customers have spoken and we've listened! **"Bring back the Powerlines newsletter!"** they shouted — and we're happy to comply.

The new version of Powerlines will contain much of the same type of content as before. In this issue, look for an overview of the semiconductor market. We take a look at some of the new products that TEAL has developed or has in the works. Also, you can see some examples of what TEAL employees do outside of work.

We'll be sending this out via mail and it will also be available as an Adobe Acrobat PDF on our website, www.teal.com. If you'd like to be added to the mailing list, contact your TEAL sales representative or drop an email to marketing@teal.com.

And thanks for reading!

TEAL NEWS...

ISO 9001: 2000 compliance A year ahead of schedule

In November 2002, TEAL Electronics was audited and certified to ISO 9001:2000 by DNV (Det Norske Veritas), more than one year ahead of the deadline. TEAL was among the first wave of companies to be certified to the newest standards in 2002. All applicable organizations are required to be registered/certified to ISO 9001:2000 by December 15, 2003. TEAL was originally certified by DNV to the 1994 release of ISO 9002 in 1995.

The ISO (International Organization for Standardization) 9000 standards are a set of international quality management system standards and guidelines. The newest revision of ISO 9001 is based on eight quality management principles that reflect best management practices. These principles include customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, and mutually beneficial supplier relationships. These new ISO principles also align with

TEAL's own principles to better assist us in meeting or exceeding customer expectations.

TEAL Awarded Patent for Adaptive Surge Suppressor Technology

TEAL Electronics was recently awarded another patent related to our power quality product lines. U.S. Patent No. 6,535,369 B1 was awarded to Randy Redding, Victor Soto, and Rey Llanos for "Adaptive Surge Suppression", which is a surge suppression circuit with imminent failure detection and self-maintenance capability.

Surge suppression devices are typically employed on the AC power mains to help protect electronic equipment from spikes, surges, and other electrical noise transients that could disrupt or damage downstream electronic equipment. One weakness of traditional surge suppression devices is that they tend to sacrifice themselves in the act of protecting the downstream equipment, and consequently they can only protect for a limited time before they are no longer useful. It is often difficult if not impossible to tell if



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the surge suppression device is still active and useful.

The TEAL patented Adaptive Surge Suppression technology has a circuit topology that includes at least two surge suppression devices. Initially, only the first device is actively connected to the circuit being protected and the second (or any subsequent) device is isolated from the circuit being protected. If and when the first suppression device approaches failure, the patented circuit switches out the used suppression device and automatically activates the second suppression device. Multiple stages of backup suppression can be employed and easily monitored; in this chain, each device is not electrically connected to the circuit being protected until the device preceding it approaches failure. This method assures that the user knows that the surge suppression device is protecting the valuable downstream electronic equipment.

For information on application of the TEAL Adaptive Surge Suppression to your systems, please contact TEAL technical support at 1-800-888-TEAL.

TEAL employees lend a hand to Habitat for Humanity again!

Two dozen TEAL employees (including a few spouses) grabbed their work boots and gloves and headed down to National City on Saturday March 29th to help on two of the homes being built by San Diego Habitat for Humanity. Unlike our last volunteer project with Habitat, these houses had roofs already! Our assignment was to hang drywall and that we did. We put up ceilings and walls, marking studs for all those drywall screws we used! A couple of the volunteers worked on building a cement block retaining wall for one of the homes' driveways. We worked well together as a team and survived without splinters, sunburns, or smashed thumbs! Our employees volunteered their personal time in this local homebuilding project. Also participating in the construction project



were the future homeowners and various other volunteers. San Diego Habitat for Humanity, Inc. is an affiliate of Habitat for Humanity International, a non-profit, ecumenical organization that provides home ownership to low income families. This affiliate constructs and provides homes to low income families within San Diego County. Habitat for Humanity is committed to the ideal that all people deserve a simple, decent place to live on terms they can afford to pay.

Homes are built using tax-deductible contributions of land, materials and money, the labor of volunteers, and the "sweat equity" labor of homeowner families. Volunteer labor is used almost exclusively in the construction of these projects. TEAL Electronics would like to thank each volunteer personally for contributing his or her own time, hard work, and sweat to this most worthwhile project.

"Habitat does more than build homes, it builds families, neighborhoods and communities by bringing people together in a spirit of friendship and teamwork." —*Jack Kemp*

For more information on San Diego Habitat for Humanity or to volunteer, visit their website at <http://www.habitatsdiego.org>.

TEAL Pursues Worldwide Manufacturing

In response to customer needs for lower cost products, TEAL Electronics is pursuing worldwide manufacturing capabilities to reduce the production costs of our products. TEAL has been manufacturing some products and sub-assemblies in Mexico for the past two years, and is actively pursuing the same capability in China for high volume systems that will be delivered to Southeast Asia.

TEAL continues to be proactive in pursuing cost-reduction methods.



TEAL continues to be proactive in pursuing cost-reduction methods and lower cost designs to help our customers meet their decreasing cost targets, and lower cost manufacturing capability is one of these methods. To learn more, please call TEAL at 1-800-888-TEAL.

TEAL ELECTRONICS:

More Than Just Transformers

Odds are good that when you think of TEAL Electronics, you think of one thing: Isolation transformer-based power conditioners and power distribution units.

Truth be told — we blame ourselves! Since 1985, TEAL has developed a reputation as the premier supplier of semi-custom power conditioning units, utilizing patented transformer, power protection, and manufacturing technologies, and the TEAL commitments to quality, mass-customization, and building partnerships with OEM clients. We're very good at what we do — and our long-term relationships with major OEMs in the industries that we specialize in are a testament to that! But when you are this good at one thing — people tend to forget the many other products and services that TEAL can provide.

Continuous Voltage Regulation

In 2003, TEAL introduced a high reliability sub-cycle continuous voltage regulator. The TEAL voltage regulator utilizes a dual conversion engine to tightly regulate the AC delivered to the customer's equipment while isolating the customer's equipment from the AC mains. The TEAL voltage regulator is designed to be seamlessly integrated into the standard isolation transformer based power conditioner that we have been producing since 1985. Many of our customers have reported that voltage regulation traditionally has been a technology with either questionable performance or questionable reliability. The TEAL voltage regulator is a high



performance voltage regulator designed and built to the very high reliability of the TEAL products. For situations and applications that require active voltage regulation, TEAL has the product to meet your needs.

Integrated UPS Systems

For several years, TEAL has been integrating small UPS units into our larger power conditioners when the customer wanted to make sure that a critical part of their system had a built-in back-up power source. Over the past couple of years, TEAL has seen the number of power conditioners with integrated UPS capability multiply as the stability of the traditional power sources has come into question.

Many customers have opted to integrate a reasonably small (and consequently low cost) UPS unit into the TEAL power conditioner to provide uninterruptible power to their control



computer, console, or other critical subsystems. The majority of the customer's equipment is still well protected by the traditional TEAL power conditioner (including isolation, grounding, filtering and suppression, etc).

Benefits of the integrated UPS within the power conditioner include a smaller overall footprint, full site-prep in one box, a single supplier partner, and a single source for service and support.

With the addition of the voltage regulator and the increasing integration of small UPS systems into the traditional power conditioner, TEAL is striving to continuously expand our product lines and value-added offerings to better serve our valuable customers. To learn more, please call TEAL at 1-800-888-TEAL.

How TEAL has dealt with the prolonged semiconductor market slump.

First, a little background. Through early 2000, the semiconductor industry was functioning close to capacity, industry executives were euphoric, financial analysts were projecting semiconductor sales to surpass approximately \$350 billion by 2003. Additional capacity was being added as quickly as it could be delivered and installed. Pricing pressures were non-existent; lead time was the driving parameter. Shorter lead times meant faster time to market, which translated into increased market share and larger profit growth. The future looked bright!

Late 2000 brought an unexpected downturn in demand for semiconductors. Capacity utilization rates fell, having a negative impact upon the semiconductor equipment industry. Decisions to purchase new equipment were now being driven only by technological advances, not production requirements. Industry consolidation and downsizing are typical during downturns, and the semiconductor

equipment industry was no exception. Increased focus on manufacturing efficiency brought production in-house to achieve cost controls and avoid acquisition, or worse.

The outlook for the semiconductor industry is little changed from late 2000. Expectations of a recovery from this long and deep market slump have been postponed by a number of factors beyond industry control—a slowing economy, Sept. 11, and the war in Iraq. There has been a 180 degree shift in focus from the boom times of the late 90s. While still important, lead times are less critical to success due to reduced demand. Reduced costs and pricing have assumed paramount importance. Manufacturing is being subcontracted offshore, reducing production labor costs and positioning facilities closer to the end user. China and Southeast Asia are the areas receiving

most attention from these efforts.

In response to these challenges, TEAL has aggressively pursued cost savings throughout our company. We have streamlined our engineering and manufacturing processes. Customer service and support are areas of primary focus in our attempt to meet and exceed customer expectations. We have undertaken extensive product re-design efforts to assist our customers' cost reduction efforts. Our standard lead time of 2.5 weeks greatly assists our customers in reducing their inventory and improving cash flow. TEAL Electronics has been focusing all our resources in an effort to provide the best value and consistently high quality products in a difficult market environment. TEAL will continue to strive for continuous improvement in support of our customers, no matter what the market conditions may be.



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TEAL's industry reputation and wide customer base has helped OEMs to smoothly integrate their power quality efforts through the corporate merger or integration.