Solar Recharger Builds Buzz at Transcend

In a universe of savvy competitors, Somnetics International has managed to carve its niche in the CPAP galaxy with a nimble culture, a healthy dose of innovation, and most recently a little help from a rather large star.

After the Transcend gained attention as the smallest and lightest CPAP, engineers at Somnetics International examined the mobile theme yet again, focusing their energies on the crucial battery. The Minnesota-based company ultimately created a solar battery recharger, an innovation that earned the Provider's Choice award at Medtrade Spring 2012.

Tentatively called the Transcend Portable Solar Charger, the 30 inch × 22 inch device resembles a soft quilt, able to be folded and put into a suitcase or backpack. According to Eric Becker, Engineering Manager at Somnetics, additional modifications are possible before the product officially goes on the market. "At this point, we are making sure we have a full understanding of how fast these batteries will charge in non-ideal conditions," explains Becker. "We don't want someone to buy this, go out and charge his battery, and have it die in 4 or 5 hours."

Beyond these last few tests, essentials such as charger circuitry and safety controls are in place. The product is ready to go, but Becker is determined to leave no stone unturned. If all goes well, he predicts official release at the end of June, following the Associated Professional Sleep Societies (APSS) show in Boston.

Stars are Aligned

Young, aggressive, and driven are all words that accurately describe Somnetics, a relatively new company that embraces a nimble culture. "We do happen to have a lot of young talent," says the 26-year-old Becker. "Regardless of experience, our engineers don't have the mindset that they can't get things done. They push for these projects and have a personal investment in the projects."

The Transcend Portable Solar Charger is one of those projects with a fast turn-around that came off the wish list generated by patient and clinician feedback. Part of an ambitious goal to release something new every 3 months, the plan to harness the sun's rays seemed like the perfect complement to the travel CPAP niche.

Users can plug the CPAP unit into the wall anywhere and/or use a battery that charges in the traditional manner (plus a back-up feed), but what if someone is traveling for a week or two? What if the area is somewhat remote, without ready access to traditional recharging?

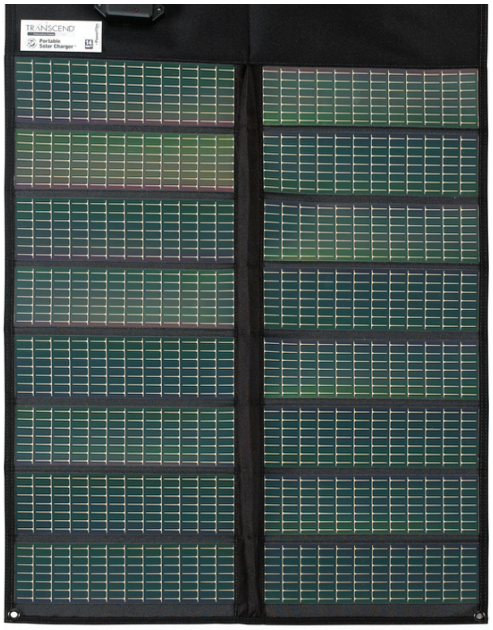
The massive awareness of sleep disorders has penetrated into the younger population, and suddenly the idea of backpacking CPAP users is not so farfetched. Once Becker and his colleagues had the vision, they went searching for answers, working with solar vendors to solve the inherent challenges of an inconsistent power source.

On the other side of the argument, the so-called "inconsistent" power source could, in fact, be counted on every day—though the relative intensity would vary. "It's a variable current," muses Becker. "How can we charge a lithium ion battery and charge fast enough so that we can charge this every day and use the CPAP for 8 hours a night? We continued to meet with several companies, and we found a company based in Ames, Iowa, that could help us. (PowerFilm, Inc.)"

Avoiding a Meltdown

Becker encountered many issues with solar design, including the limitations of lithium ion battery cells that require a specific voltage, and a specific limit on current. "You also must have temperature controls to ensure that you don't encounter thermal runaway, and that the batteries don't melt down and cause a hazard for users," explains Becker. "Next is how can we use our battery design as it is today with a solar panel given the safety concerns and regulatory controls on the cells? We wanted to conquer those issues without having to release an entirely new battery. In the end, we found a way to charge our batteries without changing any of the existing circuitry."

Cutting the device down to a manageable footprint was not easy, but Becker reports that they can still do all needed charging in one day. "If we can charge the battery at full capacity for the entire charge time, we can charge a 4-cell in 4 hours and an 8-cell in eight," he says. "Ideal conditions can't be expected with a solar panel, so it's just a starting point. As we enlarge the panel, we really can't increase that current because it is controlled by the battery. In less ideal conditions,



such as clouds in the sky, we can ensure we are getting the highest charge rate possible with a larger number of panels."

Beyond the nuts and bolts, a marketing strategy has emerged that Becker admits is still evolving. One point to stress is that the solar panels can be used every day, and will last every bit as long as the battery itself.

Somnetics will likely market the item more as an accessory device, and something supplemental to the traditional AC adaptor charge. But for those out camping, fishing, or hiking, it may be the only option. As such, company officials hope to capitalize on this vibrant and growing market.

Plans are in place to exhibit at the APSS (Sleep) show in Boston, an opportunity to show the final product that will likely be available for sale and officially out of the bag just a few weeks later. With so many competitors around, does Becker worry about someone copying the idea? "Those are some of the considerations we will take into account before we do a full release," admits Becker. "There are some unique things we're doing in converting a solar current signal to a battery charging signal. That circuitry will be built into our panel and actually riveted onto the device, which makes it something fundamentally different that an over-the-shelf solar panel."

Accolades and Misconceptions

With no less than two Medtrade awards and the Frost & Sullivan Award for Best Practices earned by Somnetics, company officials have reveled in positive feedback. Becker acknowledges that the relatively small company is now on the radar of the "big boys," but he insists the attention will not change the way the company operates. "Everybody loves the positive feedback, and it affirms that we are moving in the right direction," muses Becker. "It is making people realize that Somnetics is going to continue to come out with new products that revolutionize what we're doing with CPAP therapy."

Despite the awards, some naysayers persist, and Becker attributes these comments to general misconceptions about solar power. "People think solar will cost too much to be supplemental to an actual CPAP device," he laments. "We have been able to shrink this device down well enough that we have a price point that is acceptable to the market. Beyond that, it comes down to power capacity. Can a 3-foot by 3-foot solar panel truly charge that battery well enough for me to sleep using this device? Yes, it can be done."

Headboard Hooks and More

With the belief that accolades come as a byproduct of hard work, Becker and his engineering team are continuing to tweak the Transcend Solar while also working on a new stand for the device that features an LCD output screen. The screen will give patients the opportunity to review portions of compliance info directly from the system without needing Transcend's application software for the computer.

An additional extension device will be coming out this fall that will build off the standard Transcend CPAP. "We are going to have new functions in the software and even some new mechanical features to promote patient compliance and DME tracking," enthuses Becker. "We plan to present it at Medtrade in Atlanta."

Two other subtle evolutions of the Transcend, including a new filter replacement methodology, are on the horizon. And despite the environmentally friendly solar technology, Becker says the company wants to continue to push the "green" envelope by developing a way to replace filter media in the device without throwing away plastics. "We also plan to offer headboard hooks to hang the device on instead of putting it on the bed stand," says Becker. "It's all part of our mission to continue having something to show at least once a quarter."

"Nobody knew our name when we came out," adds Becker with a chuckle. "We were the niche product and we were not a threat. Now with these awards over the last 6 months, we are more of a true competitor. Now our customers and our competitors realize we are going to be around for the foreseeable future."