



## Parker, Vectrix and Protonex Unveil Second Generation Fuel Cell / Electric Hybrid Scooter

October 29, 2004 - The second generation of the world's first patented fuel cell / electric hybrid maxi-scooter will be unveiled at the Fuel Cell Seminar in San Antonio, TX on November 1, 2004. Developed jointly by Parker Hannifin (NYSE:PH), the global leader in motion and control systems, Vectrix Corporation, a leading edge zero-emission vehicle company, and Protonex, a manufacturer of fuel cell power solutions for portable applications, the fuel cell / electric hybrid scooter (VX-FCe) promises consumers and fleet operators clean, efficient and convenient personal transportation.

Parker is leading the development of the VX-FCe which is targeted for launch in select European and US cities within the next two to three years. The VX-FCe fully integrates the Protonex NGen™ 500 watt fuel cell system with Vectrix's high performance battery-powered electric maxi-scooter. The fuel cell system continuously charges the batteries which in turn provide power, via the motor controller, to drive the motor. The fuel cell more than doubles the range of the scooter and frees it from the constraints of charging from a fixed power outlet.

The VX-FCe boasts a top speed of 62 mph (100 km/h), rapid acceleration 0–50 mph (80 km/h) in 6.8 seconds and a range of up to 150 miles (240 km). The patented throttle activated regenerative braking system further extends the range of the VX-FCe by directing energy back into the battery pack.

“Fuel cell technology offers much promise for the future. To fulfill that promise we are working hard to transform the basic technology into commercially viable products,” said Craig Maxwell, Parker's vice president of technology and innovation. “The team working on the second generation hybrid scooter has made significant progress towards that goal with a greater than 50% reduction in size, weight and cost of the fuel cell system, which is now entirely integrated within the frame of the bike.”

“As the reality of the ‘hydrogen economy’ nears, Parker's broad range of fluid and motion control components and established manufacturing infrastructure will enable us to work successfully with fuel cell OEMs, like Protonex, to help commercialize their products and applications,” added Maxwell.

The fuel cell / electric hybrid team chose the hybrid configuration as it uses the best aspects of each individual technology. The battery pack provides the quick “bursts” of power needed for acceleration and steep inclines, and the fuel cell provides a continuous “trickle charge” to keep the batteries “topped up”, extending the range of the scooter. The fuel cell shuts down automatically when the battery pack is fully charged.

While the primary benefit of the hybrid configuration is extended range, there are a number of other important advantages:

- **Longer battery life** – Deep discharge cycles are minimized as the fuel cell is constantly charging the battery pack.
- **Extended fuel cell life** – The life of the fuel cell is maximized as it operates at a constant level.
- **Reduced weight** – The size of the fuel cell is minimized as the battery pack provides peak power to the motor. The battery pack can also be reduced as it is constantly charged by the on board fuel cell.

- **Convenience** – No need to locate a fixed electrical outlet for recharging.
- **Environmentally friendly** – The VX-FCe is virtually emission free and is much quieter than a conventional gas-powered scooter.

“The economics for a fuel cell hybrid improves significantly by minimizing the size of the fuel cell and using a battery pack to deliver power to drive the motor,” said Peter Hughes, vice president of technology for Vectrix Corporation. “By using a 500 watt fuel cell and a reduced size battery pack the performance goals can be achieved at a competitive price.”

“In line with Parker’s *Win Strategy*, the goal of our Fuel Cell Systems Business Unit ([www.parker.com/fuelcells](http://www.parker.com/fuelcells)) has been to become a one-stop supplier to our fuel cell customers and those who see the future in clean alternate energy solutions. The hybrid scooter is a demonstration platform for Parker’s ability to integrate a wide range of components into functional subsystems which can enhance performance while achieving significant cost reductions, thus enabling fuel cell OEMs to bring commercially viable products to market,” said Maxwell.

With annual sales exceeding \$7 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of commercial, mobile, industrial and aerospace markets. The company employs more than 48,000 people in 46 countries around the world. Parker has increased its annual dividends paid to shareholders for 48 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's web site at [www.parker.com](http://www.parker.com), or its investor information site at [www.phstock.com](http://www.phstock.com).

Vectrix Corporation was formed in 1996 to develop and commercialize zero emission vehicle platform technologies focused on two-wheel applications. With a single focus to provide clean, efficient, reliable, and affordable inner-city executive transportation, Vectrix is leading an urban transportation revolution. For more information, visit [www.vectrixusa.com](http://www.vectrixusa.com).

Established in 2000, Protonex manufactures long duration, portable and remote power sources. Protonex provides complete power solutions, fuel cell stacks and application services to OEM customers for portable and remote off-grid applications under served by existing battery, generator, solar and other power technologies. The company’s innovative fuel cell products complement existing power technologies and are utilized in hybrid designs for customer applications in the 10 to 500 watt power range. For more information, visit [www.protonex.com](http://www.protonex.com).

#### **Contact Information:**

Parker Hannifin Corporation  
Tom Ollila, Fuel Cell Marketing Manager  
1 (781) 939-4711  
[tollila@parker.com](mailto:tollila@parker.com)  
[www.parker.com/fuelcells](http://www.parker.com/fuelcells)

Vectrix Corporation  
Jonathan Banks, Director of Marketing  
1 (401) 848-9993  
[jbanks@vectrixusa.com](mailto:jbanks@vectrixusa.com)  
[www.vectrixusa.com](http://www.vectrixusa.com)

Protonex Technology Corporation  
Greg Cipriano, VP of Marketing  
1 (508) 490-9960 x208  
[greg.cipriano@protonex.com](mailto:greg.cipriano@protonex.com)  
[www.protonex.com](http://www.protonex.com)