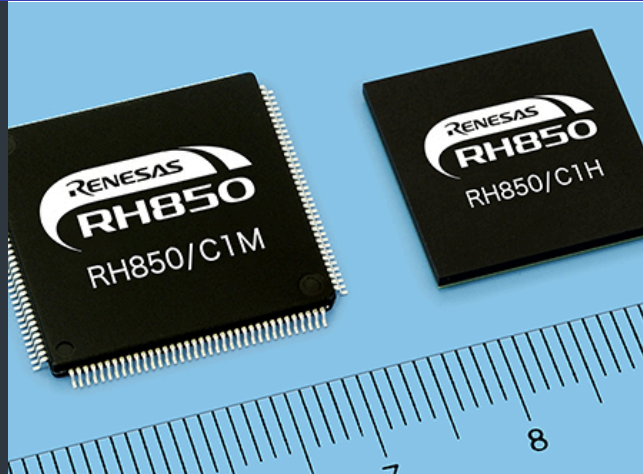


## Advanced Motor Control

To improve motor control performance, Renesas is collaborating with Tamagawa Seiki Co., Ltd., a market leader in R/D - A function that calculates the motor rotation axis angle using analog signals of the resolver sensors - converter ICs, and is adopting that technology to incorporate R/D converter functionality into the RH850/C1x Micro's. Furthermore, the RH850/C1x Series combines the motor control IP core EMU2 (enhanced motor control unit 2, - A hardware unit that performs motor control calculations based on motor current inputs, motor rotation angle inputs, and the command value, and outputs the results through a motor control timer. This allows the RH850/C1x Micro's to implement three types of motor control in hardware: sine wave PWM, overmodulation, and square wave. Switching between these three types of motor control according to the required drive conditions allows for highly efficient motor control, enabling the Micros to achieve faster and higher performance motor control without imposing a load on the software.



## Renesas EV Micros

Renesas Electronics has announced the new RH850/C1x series of 32-bit microcontrollers designed for motor control in hybrid and electric vehicles. The new RH850/C1x devices can be used with the RAA270000KFT RH850 family power supply management IC, which integrates into one device all the power supply systems required for micro operation, two external sensor power supply tracks, and a full complement of monitoring and diagnostic functions, reducing the user burden associated with power supply system design. According to Renesas, today's higher-performance applications require Micro's with greater processing capabilities for efficient motor control, challenging system designers to reduce costs and increase performance. By integrating hardware peripherals into the MCU, designers can reduce overall system costs and meet performance requirements.

## Renovo Motors

Renovo Motors was founded in 2010 and works out of California's Silicon Valley. Its first - and only - project is this EV Coupe, and is said to showcase the company's patent-pending electric technology, on which Renovo has been working 'in stealth mode' since the company's formation.

Why the Shelby Cobra look?? The shape was nearly perfect 50 years ago," explains Renovo advisor and designer Peter Brock. Inside and here's where everything gets fast. A pair of mid-mounted twin sequential axial-flux motors each drives a rear wheel, mapped to produce a combined power output of 500bhp and provide a whopping 1000lbft of torque. These are fed by a lithium-ion battery pack, which can be fast-charged in just 30 minutes.



## Renovo Coupe'

Silicon Valley-based startup Renovo Motors just unveiled one of the world's most spectacular all-electric sports cars: the Renovo Coupe. The Renovo Coupe borrows its chassis from the Shelby CSX 9000 and it's powered by a 500 horsepower electric motor and a 740 volt battery pack. But all that power doesn't come cheap - only 100 units are planned for production and prices start at an astonishing US\$529,000. According to Renovo, its 1475kg package can reach 0-60 mph in 3.4 seconds and it has a top speed of 120 mph. A running prototype of the Renovo Coupe was shown to the public for the first time on the 16<sup>th</sup> of August at the Pebble Beach Concours d'Elegance in Monterey, California. Renovo's founders, Christopher Heiser and Jason Stinson hope that the Renovo Coupe will be able to compete with the best supercars from Ferrari and Lamborghini. They also feel that the Renovo Coupe will fill a new space in the electric car segment, since Tesla no longer produces the Roadster sports car.





## Zero Police Bikes



The Clovis Police Department in the San Joaquin Valley, half way between Los Angeles and San Francisco, has purchased five Zero Electric Police motorcycles, which will immediately join the force's existing BMW R1200s, patrolling the city's streets, trails and events. The five were purchased for just under \$95,000, thanks to a grant from the San Joaquin Valley Air District. Thirty more e-cycles are in the grant pipeline, and will soon go into service in Fresno and other locales in the Valley, which famously suffers from bad air quality, and has an exceptionally high asthma rate. There are two bikes being rolled out for law enforcement services: The Zero SP and the DSP. The former is intended solely for street usage, while the later can be used both on and off road. With a range of 151 miles (243 km) on one charge, the city bike should suit police operating in urban environments quite comfortably, then go home plug in and be ready for the next day.

## KillaJoule



Making electric speed racers seems to run in the Dube' family, Bill Dube' – creator of KillaCycle – has to share some trophy space in the Den. At the recent Bonneville speed trials Eva Hakansson, Bills wife, took a 240.726mph (389kmh) run in her designed and built KillaJoule all electric sidecar. This gave Eva the envious title of the fastest sidecar racer on the planet; even faster than the gas powered units. In fact this is the first time in over a century that an electric powered vehicle has held a world speed record; not a bad effort!! Hakansson and Dubé, both mechanical engineers, have worked on KillaJoule for five years. It is powered by two Rinehart Motion Systems PM100 controllers that, combined, produce 400hp. The motor is an EVO Electric AFM-240, capable or 500HP.

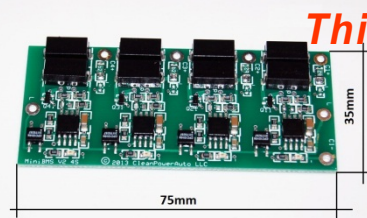
It weighs about 700kg including Hakansson, is 19 ft (5.6 m) long, 21 inches (0.53 m) wide – 45 inch (1.14m) with sidecar – and 38 inches (0.96 m) in height. Energy is stored in 4 modules of A123 Systems Lithium Nano-Phosphate cells totaling 400V, 10kWh and weighing in at 150kg. During the speed run the battery modules were changed out for a fully charged set in order to make the backup run within the 2 hour cut off period for speed trials, however normal charging is performed by a 12kW Manzanita Micro charger powered by a bio-diesel generator at the race track or from wind generators when at home. To stop this beastly two Kevlar ribbon brake chutes are fired out the back of the bike, pneumatically propelled by Bimba air cylinders.

## The *SHAPE* of Things to Come??



## Quant e-Sportlimousine Nanoflowcell

It seats four, has full-length gull-wing doors that grant access to both front and rear seats, and stunning super car looks. Its performance specifications are in Tesla territory, and it's just received German road safety authority approval. The company behind it — NanoFlowcell — was founded by Nunzio La Vecchia, a physicist and electrochemical engineer, who seems to have cracked it for powering EV's with flowcells. This beauty has a claimed 0-62mph time of 2.9 seconds and a top speed of over 217 mph, claimed 372 mile range and four-wheel drive capabilities. The Flow cell system has a storage capacity of 120 kilowatt-hours made possible by ultra-high density flow cells and two large electrolyte tanks taking the place of traditional battery technologies. The fun part about this flow cell technology comes in the form of replenishing the electrolyte or at least one of the electrolytes with salt water. Recharging is simply a matter of changing the chemicals in the tanks and you're ready to go again. BTW, Christian von Koenigsegg has a stake in this project.



## This Month's Technology Review

MiniBMS from Florida has just released the 4S board that looks after 4 Lithium cells on the one module. This option allows for remote BMS functions for cells that are located in non-viewable or tight locations where cell top modules could not be mounted. Mini BMS have designed the 4S board to integrate

with the standard individual cell modules via a normally closed loop signaling feature. A main "head end" board terminates the loop and provides connection for charger and motor controller interlocks as well as warning alarms. 4S boards can be ordered to suit Winston, TS, CALEB, HiPower or LiNMC cells. Voltages are optimised for each chemistry from 3.6v through to 4.2v per cell. Price US\$48 per board. <http://minibms.mybigcommerce.com>