



Solar - The only way to fly!

The wings carry most of the 11,628 solar cells on board, but even with more than 185 square meters of photovoltaics, there's not a great deal of energy available to drive the four electric motors.

Solar Impulse at a glance:

- Wingspan: 63.4 m (208 ft)
- Length: 21.85 m (71.7 ft)
- Height: 6.40 m (20.9 ft)
- Weight: 1,600 Kg
- Motor power: 4 x 10 HP electric engines
- Solar cells: 11,628 (10 748 on the wing, 880 on the horizontal stabilizer)
- Average flying speed: 70 km/h (43.5 mph)
- Maximum altitude: 8 500 m (27,900 ft)

HB-SIA

Developed by a team of 70 people over seven years, HB-SIA is a very impressive feat of engineering and, quite a lesson on just how much you can achieve with only a small amount of energy.

Solar Impulse is currently on standby for its first international flight. Brussels has been chosen as the destination for the first venture outside the Swiss airport of Payerne, which follows the solar powered aircraft's maiden flight and first overnight flight last year and will mark another important step towards the goal of flying around the world in 2012. Keeping weight to a minimum is critical and despite the aircraft's huge 63 meter wingspan, its carbon fiber frame and super light components weigh in at just 1600kg – which is a little like stretching your family car to be the width of an Airbus A340.

Range_E

A full recharge from a standard 240 volt power supply can be accomplished in around four hours. It is designed for a new generation of Toorak tractor drivers who cover less than 40 kilometres a day and therefore the EV range offered by this technology will support the majority of short urban journeys, where fuel economy and emissions are of prime concern. However, for longer journeys the diesel hybrid drivetrain will engage and continually optimise CO2 emissions by the use of regenerative braking and an intelligent driving system that selects the most appropriate, efficient driving method. Overall CO2 emissions are just 89g/km, yet Range_E has a maximum power output of 250kW and a top speed of around 193kmh, while delivering a fuel economy of 2.7l/100km (85mpg). With this type of fuel efficiency the hybrid system can do 1,100 kilometres on a tank of fuel.



Land Rover 4WD Hybrid

Geneva 2011 saw the first presentation of Range_E. This development model is equipped with a plug-in hybrid diesel-electric powertrain that Land Rover expects to make available in future models, following the scheduled launch of its diesel-electric hybrid in 2013.

Range_E is based on the Range Rover Sport and uses the current 180kW 3.0-litre Turbo Diesel V6 engine, working with an eight-speed automatic transmission and a 69kW electric motor. This implementation provides a parallel hybrid system, with a 14.2kW/h lithium-ion battery that can be recharged from a standard 240V power source. Range_E can be driven on electric power only for more than 32 kilometres, with zero emissions.

Range_E comes with the same full 4WD capability as the standard Range Rover Sport, with a high and low range transmission, front and rear differentials and a mechanical locking centre differential. So you could take it off road! (Does that really happen to Range's??)

SWIGZ Specs

MOTOR

Permanent Magnet, DC
Electric Motor
8,000 Shaft RPM
194 HP (145 kW)
295 Ft/Lbs (400 Nm)
Single Speed transmission
520 Racing Chain and
Sprockets final drive



BATTERY

Cylindrical LiFePO4
Lithium-Ion
360 Cells
384 Volts DC
11.5 KWh Plus KERS
High Tech Systems LLC –
Custom BMS



CONTROLLER

500 AMP, Liquid Cooled,
CAN Bus Controlled



SWIGZ.COM Electric Superbike



The SWIGZ.COM Pro Racing team has set a top speed record for an electric motorcycle of 190.6 mph (305kmh) in the April 10, Mojave Mile Shootout www.mojavemile.com Powered by a UQM Technologies, Inc. electric propulsion system. The previous top speed for electric motorcycles was in the 270 kph range. The SWIGZ.COM Pro Racing Electric motorcycle was designed and ridden by extreme electric vehicle designer and professional motorcycle racer Chip Yates.

"This run should go a long way towards our goal of demonstrating that electric vehicles can lay down extreme performance and compete directly against gasoline powered vehicles if properly designed and executed," said Yates.

The Pro Racing team are now adapting the superbike's UQM electric powertrain to optimize its performance for the Pikes Peak Hill Climb, which will take place on June 26. The team has already made news in this competition by entering the most powerful electric motorcycle ever at 240 horsepower.

At 266Kg the SWIGZ is too heavy for the Isle of Mann TTXGP's new rules so it's going to compete in the WERA series in America against the likes of Ducati 1198 and KTM RC8R superbikes. The SWIGZ.COM Pro Racing bike made history in January, by racing against conventional petrol-powered race bikes at the Auto Club Speedway in California.

The Shape of Things to Come??



Not so much a future potential but almost - almost! a common reality. Over the Easter break Peter (Reeves) arrived with a Paul & Sabrina Open Source (Cougar) controller kit (144volt - 500Amp). Never one to say no to an interesting electronics project I spent about a dozen hours over the following week putting it together. The kit contents are beautifully prepared; the circuit boards are high quality and the electronic parts come in individual bags with identification numbers printed on the label. All that is required for assembly is to locate the ID number on the circuit board, find the corresponding component bag extract the contents and solder in the part. Easy! Having said that; – the construction of the Power Board (with all the MOSFETS and CAPACITORS) is a bit harder. Placing the parts is simple but you need some specialized soldering equipment to be able to heat the board to a suitable level for the solder to properly “wet” the metal; As Paul says on the web site “*Know your Limits*”.

The downloaded instructions (68pages) and online videos help in the construction phase. All up 8 out of 10; *if you have the right gear*. I'll be finalising the project this weekend; checking operation on 12 volt, 36 volt and finally 72 volt systems. If all is well it will end up in Peter's Ute on the 14th. I'll keep you posted!! KL

This Month's Q&A Technology Tip

Q: My Batteries are located in some difficult to reach locations, is there a BMS show the state of hidden batteries?



A: Ewert energy systems has produced the Orion BMS – a very sophisticated centralised BMS unit that can handle standard charge/balance functions as well as monitor cell and pack internal resistance, for potential cell failure. Check for isolation faults and show the status of all cells via the computer software supplied.

www.orionbms.com