ANNOUNCEMENT

Kylowave Universal Energy Conversion System™

Lab Module for Renewable Energy Systems

The University of Ottawa

School of Electrical Engineering and Computer Science
Undergraduate Engineering Laboratories
Ottawa, Ontario

An exciting area of future Mechatronics development is in the realm of renewable energy where there is an urgent need to accelerate the development of this field in order to address the global challenges of clean energy, climate change and sustainable development. Despite the growing need for high quality teaching with state of the art labs in renewable energy, most universities still struggle to set them in place due to a number of challenges. Firstly, funding mechanisms in universities usually do not recognize any increasing trends until the enrolments are at a high enough level. Secondly, unlike many other laboratories, renewable energy laboratories are extremely expensive due to their large size, high level of complexity and infancy in commercialization and technical development. In most cases, installation of such systems is a multi-disciplinary task that needs services from civil, mechanical, electrical, chemical, electronic, computer and telecommunication engineers.

To meet the above challenges, an experimental hybrid energy system has been built around the Kylowave Universal Energy Conversion System, KECS, as shown in the figure. The electric energy produced from photovoltaic and wind turbine systems are transported to a DC disconnect energy mix controller connected to a DC-AC float charging-inverter within the ECS that provides charging current to a storage battery and at the same time produces inverted AC power to AC loads. The design oriented platform is pedagogically organized so that it can be used for other courses with a renewable energy integration component. The platform, while primarily is aimed for teaching purposes should also satisfy the demand of research projects.

Student projects are proposed around the smart grid and hybrid energy system addressing many facets of engineering design and development. Prior to working on a project, a first stream of experiments for renewable energy is intended to be realized by a group of two or three students as one- or two-week laboratory experiments. Upon completing all the experiments, the student will be able to design and implement controllers to manage energy transfer from those sources to a variety of loads and will be able to best assess the appropriate technique to match the sources and the loads to be controlled.

To orient students toward this goal, an introductory video is prepared and available at our student activity “Green Engineers” Web site: www.greenengineers.ca, as well as at: http://www.youtube.com/watch?v=oO7hsXh2UR0

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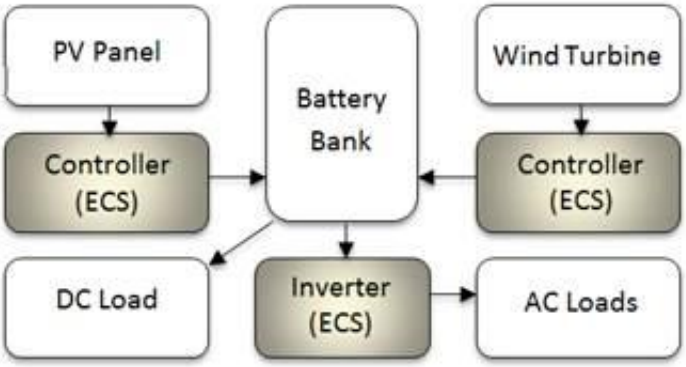
About the University of Ottawa

The School of Electrical Engineering and Computer Science (EECS) is the University of Ottawa's centre for research and teaching in all areas related to energy, Mechatronics, computing, computers and communications. The program offers four major degree programs with over 775 undergraduate students. Over 400 students pursue graduate programs in Computer Science and Electrical and Computer Engineering. Advanced research is carried out in over 15 research areas and is supported by significant grants and contracts. The school of EECS is located in Ottawa, one of Canada's prominent high-tech areas. EECS has important relationships with many local corporations.



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About Us

Our team of distinguished professionals with diverse multidisciplinary work experience has pioneered the development of automatic code generation software tools to implement complex controllers and algorithms into FPGA devices.

We provide control, simulation and verification under the same platform. Our proprietary IPs and models combined with our proprietary high-order unconditionally stable discretization technology enables commercial automatic synthesis tools to efficiently use the FPGA internal resources and achieve more than one order of magnitude improvement in the simulation time step and control loop time (compared to uP-based solutions).

Kylowave Inc. is one of the top tier companies in the LTW2009 Business Competition and a finalist in the Exploriem Startup Awards. It has been awarded three Technology Grants from Canada NRC/IRAP and NSERC.

The Kylowave Universal Energy Conversion System, K-ECS, is a key part of this simulation and verification platform. K-ECS is also a standalone product that services the educational and industrial markets.

Contact Us:

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