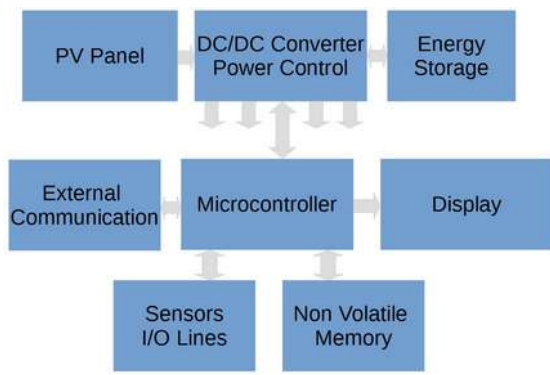


## Datalogging embedded module with flexible solar panel supply

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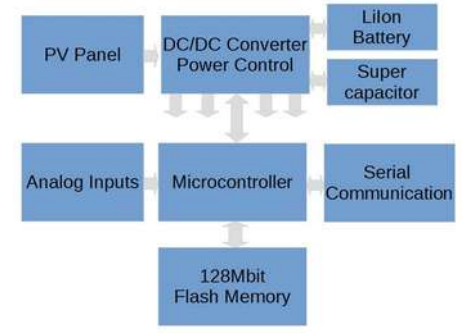


Structure of a microcontroller-based datalogger module with solar panel supply and energy storage and previous versions of solar panel based datalogging module.

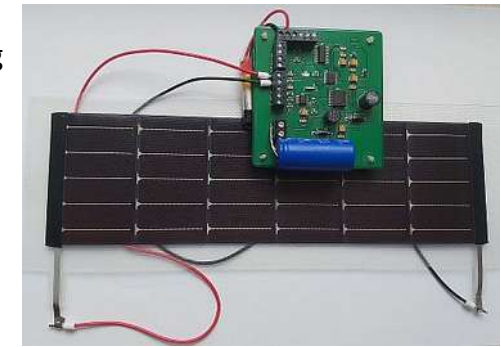
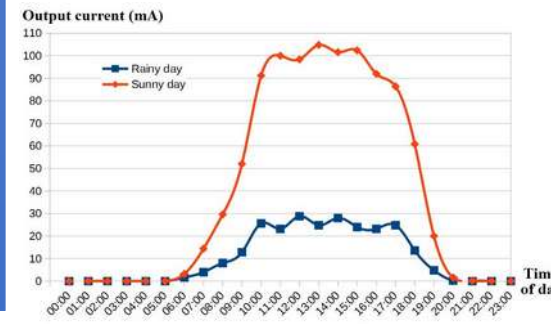


The paper presents an autonomous datalogger supplied by a flexible solar panel with a Lithium-Ion battery and a supercapacitor as energy storage. Relevant issues in design, implementation and testing are presented, as well as some measurements performed during summer days. Our team has developed several datalogger modules for different applications and some of them with photovoltaic panel supply. The proposed structure consists of 16 bit microcontroller with integrated ferroelectric memory (FRAM) and flash memory, 128Mbit flash memory chip for extended datalogging, serial communication<sup>2)</sup>, sensors and analog electronics that implements power control for charging the Lilon battery and/or supercapacitor from solar panel and supplying the entire system. A step-up DC-DC converter generates 5V output for extra functionality.

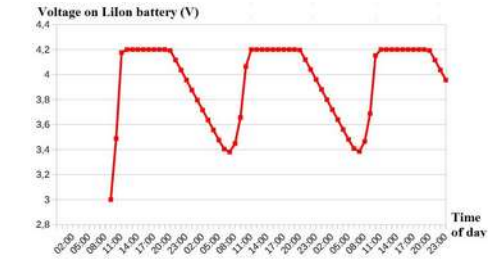
Proposed structure of new datalogging module and its implementation.



Output current from flexible solar panel during a sunny/rainy day.



Voltage on Lilon battery during a 3 days time span with a constant 10mA load.



Actual 16/32bit microcontrollers have low power consumption, integrate all required peripherals and simplify the design of dataloggers for parameter monitoring. Photovoltaic panels with reasonable sizes are able to supply such systems but storage devices like rechargeable Lilon batteries are a must if night time operation is required. Choosing the correct capacity of the battery and the power of the PV panel can guarantee a permanent day and night autonomous operation of the datalogger module.

### ACKNOWLEDGMENT

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