

# UPNA researchers develop an ultra-low consumption chip

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Researchers at the NUP/UPNA-Public University of Navarre have developed a chip incorporating a new design of ultra-low consumption, digital analogue converter; it consumes 50 million times less than a conventional light bulb. This low consumption means that the device can be powered using the reduced energy captured from the environment (light, vibrations, temperature variations, etc.). That way, energy autonomy is achieved because no batteries are needed for it to function.

The research work, the authors of which are Antonio López-Martín and Iñigo Cenoz-Villanueva, was awarded the prize for best paper at the 7th International Conference on Sensing Technology (ICST) held in Wellington (New Zealand) last December. This is one of the main international forums in the field of sensing technology and its applications; 188 papers from 38 countries were submitted at this most recent edition.

The award-winning paper came about as a result of the dissertation project of the telecommunications engineering student Iñigo Cenoz-Villanueva. His project was supervised by Antonio López-Martín, Professor of the Department of Electrical and Electronics Engineering and Deputy Principal of the School of Industrial and Telecommunications Engineers.

Wireless sensor networks constitute the main application of the device developed. These networks comprise two key elements: the sensor nodes that detect the parameters of the surroundings or the individual

(temperature, humidity, heart rate, presence, etc.), and the actuators that trigger actions (by switching devices on or off, by generating neurological stimuli, etc.). Sensors and actuators communicate with each other and with other networks like the Internet over radio waves, without leads. It is technology that in recent years has been experiencing a boom owing to its multiple applications.

This line of research of the NUP/UPNA's Communications, Signal and Microwaves group received recognition back in 2012 on the occasion of the 12th Talgo Award for Technological Innovation. On that occasion the award-winning project was geared towards providing a railway ecosystem with intelligence by means of ultra-low consumption [wireless sensor networks](#), powered whenever possible by means of the ambient energy available in the railway carriages themselves.

**More information:** A. Lopez-Martin and I. Cenoz Villanueva, "An Ultra Low Energy 8-bit Charge Redistribution ADC for Wireless Sensors," in Proc. 2013 Seventh International Conference on Sensing Technology, Wellington, New Zealand, Dec. 3-5, 2013.

Provided by Basque Research

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