

IEEE Sensors Council Demo

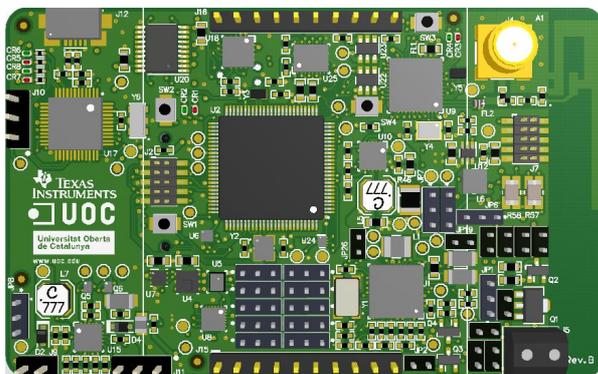
I3Mote platform

A next generation of industrial sensing and communication platform

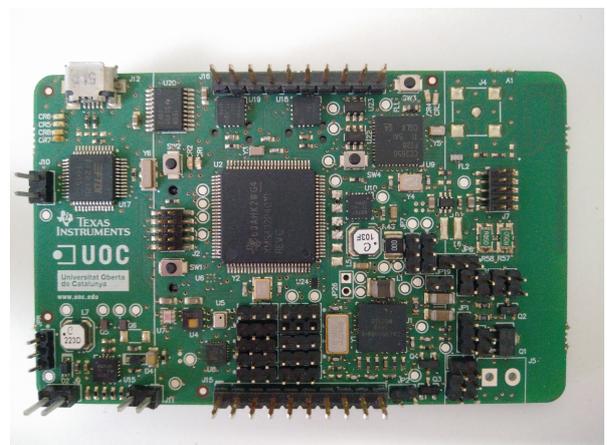
The I3Mote is a research and application development platform, developed in collaboration by the Wireless Networks Research Group at UOC and the Texas Instruments Kilby Labs. The I3Mote can be used as reference design to quickly establish a wireless, wired or hybrid (both wireless and wired) mesh network that enables data extraction from various types of industrial sensors. The I3Mote platform is targeted at industrial applications, including but not limited to: process management, automation, field transmitters, industrial wired-wireless bridging and preventive maintenance.

The I3Mote has been designed to fulfill early prototyping and early deployment needs in the aforementioned fields. Different form factors have been defined, engineering or prototyping versions aim to facilitate in-lab prototyping, while a compact and integrated version is devoted for field evaluation and deployment. The device has been engineered to meet industrial grade performance and ultra low power consumption.

I3Mote combines an advanced multi-radio low power wireless SoC, a dedicated ARM core providing processing capacity to the board and a HART interface. This is complemented with a set of industrial grade on-board sensors and an standardized smart sensor interface to support a wide range of sensing devices.



I3 Mote prototyping platform



What will be shown?

The demo will show a network of several i3Motes, executing IEEE802.15.4e TSCH and the IETF 6TISCH stack, connecting to a back-end server in the Internet and sending sensor readings in real time through the deterministic mesh network.

Authors

Dr. Xavier Vilajosana: is principal investigator at the WINE research group at UOC and professor at the Computer Science, Telecommunications and Multimedia department since Mar 2016. He has been Senior Researcher at the HP R&D Labs from Feb. 2014 to Feb. 2016. From Jan. 2012 to Jan. 2014, Xavier was visiting Professor at the University of California Berkeley holding a prestigious Fulbright fellowship. Formerly, Xavier has been Associate Professor and Lecturer at UOC. In 2008, he was visiting researcher of France Telecom R&D Labs, Paris. Xavier has been one of the main promoters of low power wireless technologies, co-leading the OpenWSN.org initiative at UC Berkeley, and promoting the use of low power wireless standards for the emerging Industrial Internet paradigm. Xavier also contributed to the industrialization and introduction of Low Power Wide Area Networks (LPWAN) to urban scenarios. Xavier is author of different Internet Drafts and RFCs at the IETF, as part of his standardization activities for low power industrial networks. Xavier is contributing actively at the IETF 6TiSCH, 6Lo and ROLL Working Groups. Xavier holds 30 high impact journal publications (IEEE Transactions, IEEE Magazines, IEEE and ACM Surveys, etc.). In addition Xavier has published in the most relevant conferences such as PIMRC, ICC, INFOCOM, GLOBECOM an obtaining several paper and demo awards. Xavier is IEEE Senior Member and member of the IEEE Sensors Council in Spain. He in addition has a deep industrial R&D profile, being author of more than 30 international patents under exploitation and having created two start-up companies. Finally, he has been involved in more than 10 FP6, FP7 and H2020 projects and with a experience of leading positions in both industry and academia.

Dr. Borja Martinez: is a postdoctoral researcher at the IN3-UOC. He received a BSc in Physics and Electronics Engineering, an MSc in Microelectronics and a PhD in Computer Science from the Universidad Autónoma de Barcelona (UAB), Spain. His research interests include low power techniques for smart wireless devices, energy efficiency and algorithms. From 2005 to 2014, he was Assistant Professor with the Department of Microelectronics and Electronic Systems, UAB. Borja is IEEE Member since 2013.

Dr. Pere Tuset: is Assistant Professor at the Computer Science, Telecommunications and Multimedia Department of Universitat Oberta de Catalunya (UOC), Senior Researcher at the Wireless Networks (WiNe) research group, and co-founder of OpenMote Technologies. He received the BSc and MSc in Telecommunication Engineering degrees from Universitat Politècnica de Catalunya (UPC) in 2007 and 2010 respectively, and the PhD in Network and Information Technologies from UOC (Universitat Oberta de Catalunya) in 2015. Currently, Pere has published 5 journal articles, 10 conference papers and is author of 7 international patents. In 2014 he received the Best Demo Runner-up Award at the prestigious IEEE INFOCOM conference for his demo on Distributed Queuing (DQ) for Active RFID systems. He is IEEE Member since 2015.