Press release

EECC´s new release of its UHF RFID transponder benchmark (UTPS) examines IoT features of the latest chip generation

Neuss, 20.09.2018. How can UHF RFID transponders be used to serialize any object and unambiguously and securely identify them without visual contact in a wide variety of applications and read out their information?
This simple question and measurements on 20 transponders performed back in 2007 has become the world's most comprehensive transponder benchmark worldwide.
Today, the questions for more than 400 transponders are: How can I adapt the behavior of transponders to the characteristics of things? How can I turn things into intelligent sensors? How can I protect the content or make it accessible only to authorized persons?

The world leading UHF RFID Transponder study shows that the latest chip generation is not only more sensitive, but also offers IoT capabilities.

New chip generation, new measuring equipment

4 new chips have been tested since the last UTPS. All of them have been tested in 25 standardized measurement procedures. The Alien Higgs EC and NXPs Ucode 8 chips reached impressive results with a 20% higher sensitivity than the previous sensitive leading Monza R6, Only 5 µW are needed to activate such a chip, which is equivalent to the thermal energy emitted by a tenth of a square millimeter of human skin. It is easy to imagine that these chips might be able to run on energy harvesting in the future.

Some NXP's Ucode chips also offers the so-called "Untraceable Command". We have dedicated a whole new chapter to this combination of programmable and RF properties.

In order to analyze these properties we used the latest equipment from our research cooperation partner CISC Semiconductor. Not only the RF performance, but also the communication properties were tested and measured. With the CISC Explorer, new functions such as cryptographic features or the selective reading of freely definable tag data content were examined for the first time.

Enabling the Internet of Things, or how intelligent should one thing be?

Tags have become more powerful and offer additional capabilities over the last years. Some chips increased data storage, i.e. the EPC memory bank has been enlarged to 448 bits (e.g. Ucode DNA) so that even the extended serial numbers such as the DUNS (Data Universal Numbering System) are feasible.
Not only the transponders can be used in a standardized way everywhere, they also provide more and more sensing information with chips such as from EM Microelectronics or Axzon

(formerly RFmicron), that for example can measure temperature or humidity of its applied object.
This dynamic information is now beginning to become intelligent using the new EPC Gen2 V2 standard. For the first time, it is also possible to define the end-user group and the readability and to protect or hide information from a tagged item.

Privacy and security according to ISO standards

Privacy is made possible by the new "Untraceable Command". This allows hiding of memory areas, reveals only partial information on request (e.g. only company, article, without serial number or only user memory). This makes it easy to manage access restrictions and control data access of sensitive data.

If securing with a 32-bit access password is not enough, new cryptographic security with AES technology (ISO/IEC 29167-10) with 128-bit password such as by the Ucode DNA is also possible. Applications of this technology in toll and brand protection are obvious. Currently license plates are already equipped according to this standard in Asia.

A particularly useful feature is that you can choose whether the tag "whispers" or "screams" thus the read range can be modified accordingly. An UHF tag with a reading range of 13 meters for logistics processes can be reduced to NFC functionality at close range, for example in use for access control systems.
With the new chips, this can even be done temporarily, enabling already interrogated loud chips to be set to a “whisper status" during bulk readings, increasing the chances to communicate with less loud tags on the interrogation field.

Outlook

UHF RFID transponders can be used in almost every industry and on every object. Objects are no longer just identifiable and their dynamical status measurable. In addition, simple systems can be implemented to interpret the collected information and control their distribution via authorization and authentication features.

“The Internet of Things of the Future, in which even simple objects can be intelligently controlled and wireless automatic exchange of information between objects becomes possible” resumes Conrad v. Bonin, CEO of the EECC with regards to the newer chip generations. The fact that this is a passive and thus maintenance-free technology and that it is also unbeatably inexpensive provides great potential for mass usage of the technology in the near future.

About EECC

In 2004, GS1 Germany, Deutsche Post DHL, and METRO GROUP have founded the European EPC Competence Center (EECC) in Neuss, Germany. The EECC is the European leader for solutions and services in the field of Electronic Product Code (EPC) and its information systems (EPCIS).
In 2005, the EECC was the first European lab to be certified as „EPCglobal Performance Test Center“ by EPCGlobal. The EECC supports the European economy with hardware solutions that handle a large amount of serialized data in an efficient manner.
In addition, the EECC offers custom software solutions for the traceability of objects along a supply chain. Based on the individual customer needs, the EECC develops EPC-based solutions that work seamlessly with any reader technology (RFID, bar code, virtual).
To complement its services, the EECC also organizes the RFID Academy to share knowledge in the area of EPCIS, Auto-ID, and RFID in collaboration with the Auto ID Lab St. Gallen, ETH Zürich, and the RWTH International University. Courses also cover relevant standards, software and architectural best practices.
The in-house developed EPC analyzing tool EPCAT was certified in May 2015 according to the latest 1.1 standard (together with GS1 solution as the world's first software). The Analytics area with the "+1" product family makes EPCIS data available to customers in real-time.
Since 2015, the EECC has also offered all software solutions as cloud services in customer responsibility.
Since 2017, it has also started to provide it as SaaS (software as a service).

The history of the UTPS study

The benchmark study „UHF Tag Performance Survey (UTPS)“ establishes a worldwide standard in the measurement of RFID transponders. It is published every year by the EECC.

Since 2011, the EECC offers manufacturers to request certification of tag performance for certain applications.
In 2012, the EECC introduced the world novelty of material-dependent backlink matrices.

Since 2013, the topic of chip sensitivity is covered in a separate chapter. Performance characteristics of write access to chip memory are included since 2014.
Since 2015, the study analyses the susceptibility of tags caused by different reader signals.
In 2016, the study adds the analysis of tag humidity sensory functionality and documents additional features such as memory.
The sensor functions were expanded to temperature in 2017.
In 2018, IOT capabilities such as the Untraceable Command were investigated for the first time.

The new UTPS 2018/2019 is now available to new customers as a print medium for €495 per year with a 5-year subscription or €995 as a single copy.

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Appendix:

Lists of examined tags

UTPS 2018 - Evaluated Tag Types Labels.pdf

UTPS 2018 - Evaluated Tag Types On-Metal.pdf

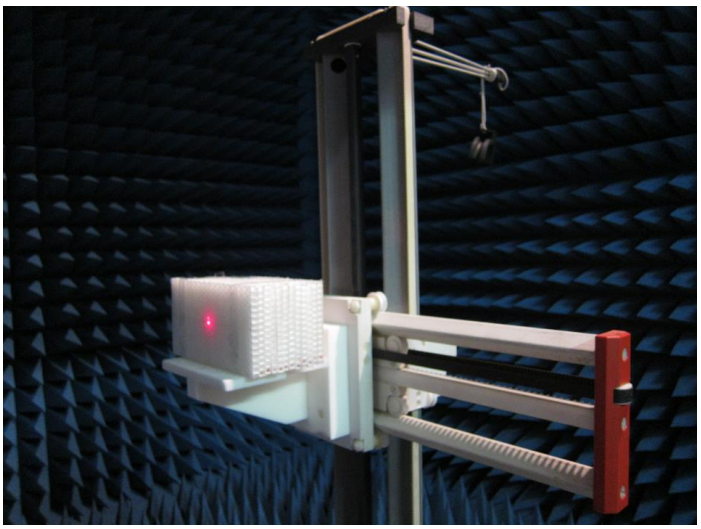
Pictures:

Pic 1. Conrad v. Bonin, CEO and Mauricio Leon, RFID expert and author present the transponder study in the EECC measuring chamber

Pic 2. Conrad v. Bonin, CEO and Mauricio Leon, RFID expert with new transponder types in the EECC measuring chamber

Pic 3. The new transponder generation becomes IoT-capable

Pic 4. Pulkles reading in the EECC measuring chamber



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