



Press release

Release of the EECC UHF RFID Almanac 2021 (Almanac):

The world's most comprehensive compendium on RFID technology now includes reader technology for the first time and presents several innovative solutions to distortions in the current chip market.

Neuss, Germany, August 31st, 2021. The Almanac provides the largest variety of strategies and approaches for the optimization of today's RFID systems available in the industry today. In this latest edition of the international study, previously known as the UHF Tag Performance Survey (UTPS), the performance of 550 tags is correlated to 36 readers for the first time. The study further contrasts technical and economic developments on the chip and transponder side to readers from variety of manufacturers. RFID readers are increasingly the limiting factor in terms of performance, reliability, and functionality of the overall system.

Comprising results from over 6 million individual measurements, the *EECC UHF RFID Almanac 2021* (Almanac) reflects virtually all scenarios in which RFID technology can be used today. As an invaluable resource for technology providers, it has long been established as the go-to guide for technical and business considerations during RFID technology deployments.

Overall, the recurring trend of chips becoming increasingly sensitive still continues, which leads to superior performance in comparison to previous years. Leading transponders such as Impinj's Monza M700 series and NXP's UCODE 8 continue to dominate the market. The good news is that we see increasing competition at the top of the market. This, of course, is urgently needed given that chip availability continues to be severely limited world-wide.

IN this environment, users can be forced to switch between similarly performing transponders with alternative chip types, sometimes at great risk. Conrad von Bonin, CEO of the EECC, states: "With the *Almanac*, however, suitable replacements can easily be identified through overview diagrams from the data of more than 550 examined transponders." Nam Anh Tran, EECC's lab director adds: "The backlink matrices of the Almanac resolve these questions according to several influencing variables at the same time, which is one of its unique features. Whether tags can be used in large populations, for example, or how they work in different read scenarios; without the Almanac, users typically only optimize one of these dimensions. It is so much easier to just look up the information rather than to take educated guesses, or worse, make poor decisions."

Many issues today reach beyond the current chip crisis. There increasingly are issues concerning older chip generations and the applications optimized for them. For example, when chips are no longer manufactured due to life cycle considerations or because their provider has gone out of business, it is increasingly hard to find suitable replacements without the requisite technical knowledge. Often these

existing solutions can be updated with Chinese products, but caution and consideration of the American-Chinese trade war of recent years is highly recommended.

Beyond increasingly powerful passive transponders, active RFID readers are increasingly determining the overall performance of an RFID system. In the past, the key criteria for reader selection were form factor, size, and price. For the first time, the *Almanac* looks at the radio characteristics of readers in that EECC examined a total of 36 readers to classify them into three categories: standard readers, specialty readers and handhelds.

For handheld and specialty readers, the focus often rests on small a form factor or optimized energy efficiency. As a result, they are significantly less performant than standard ones. Yet the performance differences are extremely large within classes as well. Ramy Hagouan, Head of RFID Applications at EECC, notes: "Reader sensitivity can often be the decisive difference for a successful RFID application. With the overviews and diagrams of the *Almanac*, it is now possible to see directly which reader fits which tag in which application."

With a focus of the *Almanac* on both sides of the overall RFID system, there is a tremendous benefit for all application scenarios that users may consider. When a new system is installed or when a reader infrastructure changes, the effect on transponders can be assessed immediately. Likewise, the *Almanac* instantly enables optimal reader selection and parameterization without the need for field testing or pilot projects. This obviously applies to cases of mixed transponder populations in equal measure.

The *Almanac* is ultimately a product of many years of EECC research, encompasses its deep knowledge and provides an unparalleled understanding of technological as well as business and economic considerations in the RFID market today. Its value ranges from avoidance of errors and miscommunications to substantially shorter project timelines and far superior results for existing and new deployments.

The new *EECC UHF RFID Almanac 2021* is now available to new customers as a print medium for €995 per issue as part of a 5-year subscription or for €1,495 as a single copy. Please contact us for questions, further information or to schedule a conversation about the *Almanac* or our many technology, research and implementation services.

About the history of the study:

With its annual benchmark study "UHF Tag Performance Survey (UTPS)", EECC has set the worldwide standard in RFID transponder performance testing since 2007. Today the organization looks back on a long and innovative history of technological, scientific and practical achievements.

In 2008 the EECC introduced material-dependent modelling for tag selection for the first time.

Beginning in 2009, a separate chapter of the UTPS has been dedicated to on-metal transponders and in 2010 EECC was the first laboratory to carry conduct proximity measurements for every transponder.

Since 2011, manufacturers have been able to have the performance of their tags certified for specific applications.

In 2012, EECC introduced material-dependent backlink matrices for the first time worldwide and, in 2013, a separate chapter dedicated to chip sensitivity. Performance parameters for the storage process have been included in the study since 2014.

The sensitivity to interference as characterized by various reader signals has been added in 2015.

In 2016 sensor functionalities were analyzed for the first time and additional features such as memory have been catalogued.

In 2018 IoT capabilities such as Untraceable Command were investigated for the first time.

In its 2019 edition, the study was fundamentally restructured into tag population dependencies, environmental parameters, and system environments.

In 2020 EECC revised the ease of use and, for the first time, tags were labelled according to their application areas while detailed explanations of measurements for practical use cases were added.

This year readers were measured and categorized for the first time in addition to transponders, and the influence on the overall performance with transponders has been included. With this extension, the study is now published under the title "EECC UHF RFID Almanac".

About the European EPC Competence Center (EECC)

GS1 Germany, Deutsche Post DHL and METRO GROUP founded the European market leader for solutions and services around the Electronic Product Code (EPC) and the networked information systems (EPCIS) in 2004.

The European EPC Competence Center shows how to collect and use this data and develops new solutions and business models for industry, logistics and retail in its Innovation Labs.

Since 2005, the EECC in Neuss has been the first European laboratory certified by EPCglobal as an "EPCglobal Performance Test Center".

Since 2006, the EECC RFID Academy, in cooperation with the Auto-ID Lab St. Gallen/ETH Zurich and RWTH International University Aachen, has been imparting knowledge in the fields of EPCIS, Auto-ID, RFID and the standards, software and architecture required for these areas.

With the annual benchmark study "UHF Tag Performance Survey (UTPS)", the EECC has been setting the worldwide standard in RFID transponder measurement and certification since 2007.

Since 2009, the EECC has been imparting knowledge about EPC networks and designing EPCIS solutions that enable the efficient handling of large quantities of serialised data. In the field of "Software and Traceability Solutions", the EECC offers tailor-made software for the traceability and/or tracking of objects in a supply chain, regardless of their acquisition medium (RFID, barcode, virtual).

The in house developed EPC Information System EPCAT was certified in May 2015 according to the latest 1.1 standard (together with GS1 solution as the first software worldwide). The Analytics division with the "+1" product family makes EPCIS data usable for customers in real time. Since 2015, the EECC has also offered all software services as cloud services under customer responsibility, and since 2017 also in operational operation as SaaS (Software as a Service).

In addition, the EECC is active in funded research projects focusing on self-sovereign identities and blockchain/smart contract use in supply chains, as well as in standardisation committees at EPCglobal, GS1 and ISO.

The overarching objective of supply chain tracking is to establish sustainable circular processes. To this end, the EECC founded the initiative "CYCLANCE - Sustainability with EPCIS and IOT" in 2019 and initiated pilot cases in various industries. All initiatives can be experienced as demonstrators in the EECC Innovation Lab, some such as R-Cycle for plastic packaging and Intelli-Pack for fresh products have received awards, e.g. the German Award for Sustainability Projects 2021.

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Appendix:

- UHF RFID Almanac 2021 – 1 Evaluated Tag Types Labels.pdf
- UHF RFID Almanac 2021 – 2 Evaluated Tag Types On-Metal.pdf
- UHF RFID Almanac 2021 – 3 Evaluated Reader Types.pdf

Images: (source: EECC)

Figure 1: Diagram: Development of chip sensitivity

File: RFID Chip Sensitivity.png

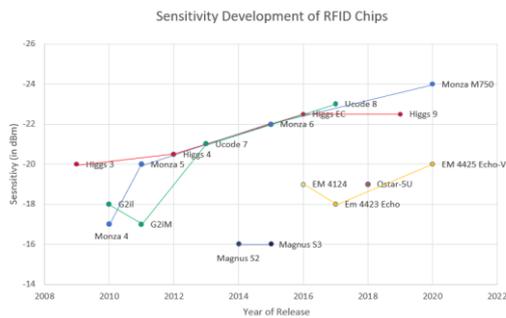


Image 2: The EECC UHF RFID Almanac combines reader and transponder measurements for the first time. Conrad von Bonin (CEO) and Nam Tran (head of the EECC laboratory) in the absorber hall.

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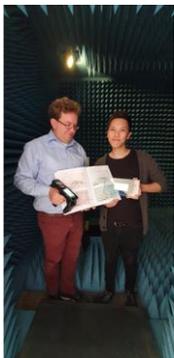
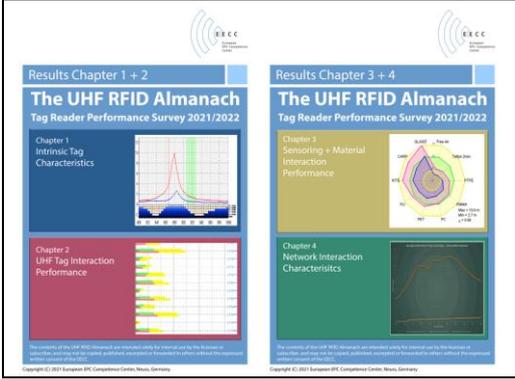


Image 3: The EECC UHF RFID Almanac 2021

File: Almanac Cover.png



EECC Logo: EECC_Logo_4C.EPS

