



## Position Paper on the EU Commission's Consultation Process on RFID

September 2006

The Informationsforum RFID e.V. is a joint initiative of companies active on the German market in the retail, consumer goods, automobile, IT, and services sectors. It is a platform for dialogue and information on all issues regarding RFID. The 15 members include DHL, Henkel, Hewlett-Packard, IBM, Intermec Technologies, METRO Group, Oracle, Philips, Procter & Gamble, SAP, Siemens, T-Systems, Volkswagen, and supporting members GS1 Germany and BITKOM. It cooperates closely with the Fraunhofer Institute for Material Flow and Logistics.

RFID has great potential for the improvement of process flows, security, tracking, and process simplification. Along with industry and services, both consumers and public administrations will significantly profit from the new key technology in a variety of application areas.

Since the beginning of the year the EU Commission has conducted a consultation process on RFID to identify key issues for policy-makers. The Informationsforum RFID welcomes the significance that the EU Commission has accorded to the key technology RFID with this process and through this paper would like to introduce the central challenges to German industry into the consultation process.

Europe today is among the leading regions for RFID research, development, and applications. Institutes such as the Fraunhofer Institute and the AutoID-Lab in Zurich and St. Gallen are worldwide leaders in research. On the industry side, enterprises such as Siemens, Philips, Deutsche Post World Net, T-Systems, the METRO Group, and Tesco set the standard for the introduction and implementation of the technology. In addition, there are numerous small and medium-sized businesses that have been successful with the technology.

The Lisbon Strategy, adopted by the European Council in 2000, demands an increase in the speed of innovation and in productivity to maintain Europe's competitiveness. RFID can make a significant contribution to this. However, Europe today is at risk of losing its leadership position regarding this technology. Competing markets such as Asia and the USA are currently making great efforts to improve their competitiveness and to secure their piece of the future RFID market. Europe must recognize and exploit its opportunities by creating a political framework for the implementation of the Lisbon Strategy so that the future of RFID technology is not shaped beyond the borders of Europe.



## I. Overview of key issues to be addressed

1. **Speedy implementation of CEPT Recommendation 70-03**
2. **Relaxation of the “listen before talk” rule**
3. **Frequency shifting from older applications**
4. **Separate frequency band for RFID**
5. **Development and establishment of uniform global standards**
6. **Support of research and pilot projects**
7. **No data protection provisions beyond EU Directive 95/46/EC**

## II. Key issues in detail

### 1. **Speedy implementation of CEPT Recommendation 70-03**

The greatest expectations as to RFID are in the ultra high frequency (UHF) range from 865 – 868 MHz. Transponders constructed for this range are less expensive and can be read much more quickly and over longer distances of many meters. The frequency parameters applicable in Europe are established in ERC-REC 70-03, which is based upon recommendations from ETSI and CEPT. They correspond to ETSI EN 302 208. In order for UHF to be used in the same band, all Member States must implement this recommendation. Until now, however, this has not fully taken place. We welcome that the EU Commission has signaled that through a decision it will work toward the quick and complete implementation of the recommendation in all Member States.

### 2. **Relaxation of the “listen before talk” rule**

The member companies of the Informationsforum RFID are working toward the exemption of a portion of the ten channels available in the UHF range for RFID as transmission channels of the readers from the “listen before talk” (LBT) rule.

In Europe RFID only has a very small frequency band available in the UHF range. The ECC's recommendation (ERC-REC 70-03) only provides for ten channels as to the maximum transmission capacity of 2 W, as well as three channels with 100 mW and two channels each with 500 mW with a total bandwidth of 3 MHz. To enable fast allocation of frequencies for the new technology, the LBT rule was introduced upon the allocation of the ten powerful channels. This rule requires that prior to transmission a reader must analyze whether another service is operating over the channel. If one is so operating, it must switch to another channel. Further, readers can only transmit for four seconds before they must repeat the search for other users of the channel.



Application of the LBT rule creates significant problems in practice. Because readers must switch or pause upon recognition of a signal of even -96dBm, transmission over the channel by a distant piece of equipment is sufficient to block the reader. Thus, only a maximum of 10 readers can concurrently operate within one square kilometer. Consequently, a large logistics center that requires more than ten readers cannot concurrently operate them in the usual manner.

The LBT rule can also create another problem for mobile readers. Even when they transmit with less power, they may endanger complex logistics chains. If a customer wants to fully benefit from the technology in a store that monitors its sales area with RFID, a channel must be left free for the customer's reader so that other applications can remain active. Another large obstacle arises from the LBT rule when attempting to enable numerous customers to concurrently use mobile readers.

The LBT rule today requires the user to establish switching solutions, which reduces both the capacity and reliability of the RFID system and make systems more expensive. Exempting a portion of the transmission channels from the LBT rule would offer the possibility of optimizing capacity within the existing limits through a fixed synchronization model and of relieving the remaining channels. More powerful transmitters and mobile readers could operate over these channels without limits. This would create the opportunity to concurrently use more than ten readers within close range.

### 3. Frequency shifting from older applications

Moreover, the limitations and disadvantages of the LBT rule are increased by use of the available frequency spectrum by older applications. Thus, for example, remote garage door openers or radio-controlled headsets operate in the same frequency range but are not subject to the LBT rule. Thus, they have uninterrupted priority over applications subject to the LBT rule. Consequently, the frequency range available to RFID readers during their operation is reduced by approximately 10 percent. These applications, thus, must be moved to other frequency ranges.

### 4. Separate frequency band for RFID

A frequency spectrum that is broader and that is exclusively reserved for the RFID technology will meet the rising demands and increasing number of applications, and will help place the growth of the technology on a secure basis.

RFID is growing at an exceedingly fast pace. It can be assumed that this growth tempo will continue to increase over the coming years. An increasing number of private RFID readers, for example, in mobile telephones and other everyday equipment, will join the rising number of transponders and commercial readers. A limited frequency spectrum foreseeably would lead to limited growth.

The importance of the RFID technology should be taken into account as part of a reorganization of frequencies, as is to be expected, for example, after the disconnection of analogue television.



## 5. Development and establishment of uniform global standards

In order to increase European influence over the development and establishment of standards, industry, associations, and institutions must participate more significantly in international standardization processes. The EU Commission should expressly promote participation in ongoing global standardization processes. This would support the development of international standards and, accordingly, would strengthen European influence. Uniform global standards, which are also the basis for the interoperability of different applications, are decisive for the global deployment of RFID.

Until now, many RFID applications have been closed systems, which generally can function without standards. Examples of this are production monitoring in automobile manufacturing, access control, and animal identification, even if they already are geared toward current ISO standards.

The expected potential of the RFID technology, however, above all lies in open systems in which a variety of participants can and may use the data from the transponder, for example, in global logistics chains. To enable data access for all, generally applicable standards must be defined. Organizations such as ISO and the consortium EPCglobal have adopted a UHF system standard for the most relevant parameters. EPC Gen2, which also has since been adopted by ISO, is particularly well-known.

## 6. Support of research and pilot projects

European research contributes significantly to the further development of the RFID technology. Targeted support programs are required for Europe to remain a worldwide leader, to support successful developments, and to transfer these to applications. New opportunities for use can only be established through testing and presentation in pilot projects. The 7<sup>th</sup> Research Framework Program, thus, should support RFID projects in a targeted manner.

A look at competing markets makes the necessity for this clear: South Korea intends to invest 800 million euro in research and development projects regarding RFID. The defense department in the USA has required its suppliers to introduce RFID and the health authorities recommend deployment of the technology in the pharmaceuticals sector.

Up until now there has been a lack of coordinated effort as to the key technology in Europe. However, this is a prerequisite for accomplishing the tasks ahead and for asserting a leadership position in global competition in this technology market.

The course is being set today in numerous development and research fields for the future success of RFID and for the positioning of the competitive international markets. Targeted support should be driven forward in Europe on the following issues:

- **Rewritability of Transponders:** The possibility to frequently modify data is important to storing various data in the transponder and not in the system. Until now the storage used could only be rewritten a maximum of 15 times, often only 7 to 8 times.



- **Polymer Technology:** In the future, transponders manufactured completely of polymers should be made possible. The materials and production would be far less expensive than transponders made of silicon chips and metal antennas. Also, they could be printed during the regular printing process together with outer packaging or book covers. Further, polymer structures are more environmentally friendly. The first mass-produced HF transponders are expected soon. It will most likely take several years before UHF transponders reach this stage.
- **Ceramic Technology:** In addition to polymer technology, research is also being conducted into ceramics. Among other benefits, this material is more suitable for processing higher currents. It will take some time, however, before initial experience with transponders with ceramic chips takes place.
- **Antennas in the Printing Process:** The further development of antennas is significant to research and development work. In the future, antennas will be manufactured during the printing process rather than through the etching process used up until now. This simplifies production and avoids the environmental burdens of the etching process. In addition, transponders can be better adapted to external characteristics. For such solutions, metal is cut up into tiny pieces and joined with a special resin. This conductive mix can then be printed onto a carrier.
- **Integration of Transponders in Packaging:** Up until now transponders were primarily integrated in labels and in the industrial area in plastic cases and then attached to the packaging or the product. To do this the packaging or even completely new product ideas must be developed.
- **Further Development of Readers:** Read rates of almost 100 percent are very important to users. More fine-tuned and less costly equipment will also help it to become further established in logistics centers, warehouses, and for access control. Just as integration with PCs and mobile telephones is obvious, research is also addressing the implementation of RFID interfaces in products such as electric toothbrushes, medicine cabinets, and kitchen equipment.
- **Software:** The further development of software for integration into existing systems is necessary to ensure the conversion of technological advancement into competitive benefits for users. This in turn improves the EU's competitive position.
- In addition to the above-named areas, research and further development in the areas of **sensors, energy supply, process management, cryptography, and displays** lead to the technology becoming more reliable and versatile and, thus, becoming more useful for industry and consumers.

## 7. No data protection provisions beyond EU Directive 95/46/EC.

For the members of the Informationsforum RFID effective data protection is one of the central prerequisites for the successful introduction of RFID. Protection of the private sphere and the personal data of users must be fully ensured.



Europe has a high level of data protection that sets an international standard. No personal data can be collected or stored without the consent of the person affected. Persons also have rights to information and the right to deletion of the data collected. The EU Data Protection Directive, thus, already covers the fields of application and possibilities for the uses of RFID in which personal data is processed. Against this background, there is no need for conformance of the statutory situation.

More far-reaching obligations in regard to consumer protection in processing non-personal data arise from existing industry guidelines, which contain self-commitments for the use of RFID in consumer areas. An example of this is the consumer protection guidelines from EPCglobal, which are applicable worldwide. At the national level there are corresponding industry self-commitments in Europe, which are continually conformed to technological developments. They are a reasonable and sufficient means for ensuring consumer protection below the threshold of statutory rules. For this reason as well, expansion of the area of application of existing data protection provisions is not necessary.

The discussion regarding more far-reaching requirements, which fails to take account of the comprehensive and sufficient data protection framework in place, could endanger the future of RFID in Europe. Disproportionate requirements in this area would not serve consumer protection, but would conceal the danger of Europe losing its edge in RFID and later having to import the technology. As a result, significant economic potential, which in the end also benefits consumers, would remain unused.