SLOVENSKI STANDARD
SIST-TP CLC/TR 50489:2007

01-marec-2007

Čipi za pametno sledenje - Študija možnosti vključitve RFID v električno in elektronsko opremo za vodenje po WEEE

Smart tracker chips - Feasibility study on the inclusion of RFID in Electrical and Electronic Equipment for WEEE management

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Etiquetage intelligent - Etude de faisabilité sur l'intégration de dispositifs d'identification à radiofréquence (RFID) dans les équipements électriques et électroniques

Ta slovenski standard je istoveten z: **CLC/TR 50489:2006**

ICS:

29.020	Elektrotehnika na splošno	Electrical engineering in general
31.020	Elektronske komponente na splošno	Electronic components in general
35.040.50	Tehnike za samodejno razpoznavanje in zajem podatkov	Automatic identification and data capture techniques

SIST-TP CLC/TR 50489:2007 **en**

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 50489

November 2006

English version

Smart tracker chips -
Feasibility study on the inclusion of RFID in Electrical and Electronic Equipment for WEEE management

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This Technical Report was approved by CENELEC on 2006-06-17.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. CLC/TR 50489:2006 E

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Foreword

This Technical Report was prepared by CENELEC BTTF 116-3, Waste from electrical and electronic equipment (WEEE).

The text of the draft was submitted to the formal vote and was approved by CENELEC as CLC/TR 50489 on 2006-06-17.

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Introduction

An RFID (Radio Frequency Identification) system consists of a transmitter, a receiver (mostly combined and called a transceiver, interrogator or reader), an antenna and a tag or transponder. The transmitter sends out a radio signal on a certain frequency by means of an antenna. This signal is recognised by the tag if within the transmitter's reading range. The tag then responds with a signal that is recognised by the receiver. Data within a tag may provide identification for an item in manufacture, goods in transit, a location, the identity of a vehicle, an animal, an individual, etc. By including additional data, it is possible to support applications by item specific information or instructions immediately available on reading the tag. A certain protocol takes care of the communication between reader and the host computer.

Three frequency ranges has generally been distinguished for RFID systems: low, medium and high. Table 1 summarises these three frequency ranges, along with the typical system characteristics and examples of major areas of application.

Table 1 – Frequency bands and typical characteristics

Frequency range	Typical characteristics
Low 1 Hz - 300 kHz	Short to medium read range Low reading speed
Medium 300 – 3 000 kHz	Short to medium read range Potentially, medium reading speed
High 3 MHz – 30 GHz	Long read range High reading speed Line of sight required

The choice of operating frequency is of primary importance in determining data transfer rates. Generally speaking the higher the frequency the higher the data transfer or throughput rates that can be achieved.

The CECED report "ELECTRONIC PRODUCT IDENTIFICATION, A Study into the feasibility of technologies that enable the identification of producer and product characteristics", (see Annex A) was considered the most relevant report available and used as main reference for this Technical Report.

1 Scope

This Technical Report investigates in the light of the implementation of the WEEE Directive (2002/96/EC) the feasibility of deploying machine readable product identification technologies (e.g. smart tracker chips) to fulfil the marking requirement for the purpose of implementing producer responsibility. The product recognition shall provide information for waste stream management (sorting, reporting and cost allocation).

Machine readable product identification technologies can be utilized during every phase of the product life cycle of an EEE. The WEEE management is the last phase. This Technical Report focuses on this phase only.

2 Abbreviations

In the body of this Technical Report the following abbreviations have been used:

CECED: Comité Européen des Constructeurs d'Equipements Domestiques

EEE: Electrical and Electronic Equipment

RFID: Radio Frequency IDentification

SWOT: Strength Weakness Opportunity Threat

WEEE: Waste Electrical and Electronic Equipment

3 SWOT Analysis of RFID use in waste management

Strength	Weakness
• No line of sight • Bulk tag reading • Not affected by dirt or scratches • Information link • Non-contact identification	• Shielding of metals • Initially only pallets & boxes are tagged • Range/Readability. • Reliability/Durability • Changing technology in lifetime of product • Recycling Industry may not use RFID unless whole WEEE category uses them • Creating more WEEE. • Missing infrastructure
Opportunity	**Threat**
• Read-rate • Cost / tag • Process innovation • Key to Product Life-cycle Management • Additional data • Data format standardization • Integrity of supply chain management systems	• Data security • Limitation of RFID use until Point of Sales • Privacy • Cost of Tag • Could be used for other purposes • Could store commercially sensitive data • Identity Theft • Miss-Identification • Future incompatibility technology changes • RFID not implemented in logistics at item level

4 Technical requirements

In addition to the requirements in the CECED report the main requirements of the RFID's are:

• Accurate multiple/bulk tag reading

• Live span of tag and information stored longer than product life

• Tag environmental compatible with the product life cycle

• Interoperability between tags and readers used for the same purpose

• Tags to fit into all product types

• The data format stored shall be widely international recognized

5 Economic requirements

According to current knowledge and the return on investments, the use of RFID for only waste management purposes is not economically feasible.

RFID use for WEEE management needs to be an integrated part of automatic products identification during the whole product life-cycle and by its included actors.

To be able to justify RFID for waste management we would have to build on existing RFID applications such as supply chain management. However until technology and standards in these other applications can become stable then RFID for waste management can not be considered.

6 Social considerations

When introducing RFID for WEEE management the following aspects have to be addressed (alphabetic):

• data security

• ethics

• health and safety

• market acceptance

• privacy legislation

7 Legal considerations

When introducing RFID for WEEE management as part of a legislative requirement it has to be at least harmonized within European Union (Article 95 in the European Treaty).

8 Environmental considerations

If RFID is introduced solely for WEEE management without taking benefit from the use of RFID in other management aspects one would just introduce an additional electronic component with a negative impact on the environment. As RFID gives an opportunity for better waste management an assessment of introducing a new component against this must be carried out.

9 Conclusion

Utilization of machine readable product ID identification for WEEE management is dependant on it being applied during production.

The introduction of machine readable product identification technologies can not solely be introduce for WEEE management purposes but needs wider consideration of all needs and limitations along the product life cycle.

The task force has not been able to determine any progress in RFID technology which significantly changes the conclusions of the CECED report.

The key conclusion from the Executive Summary of the CECED report is still considered valid:

• No tagging system currently available or available in the foreseeable future will meet the current operational requirements for disposal and logistics of WEEE.

• There is no clear financial case for adopting a tagging system in the short term (10 years). Having made substantial up-front investment then tagging may offer financial benefit over a 20 year plus period for large goods.

• The major hurdle to adoption of tagging is the acceptance of the investment and operational changes required by other stakeholders such as disposal companies and local authorities.

The resulting conclusions from the task force are as follows:

• There are no technical and economical ground for implementing RFID for waste management.

• The RFID technology are evolving and due to this fact the issue should be reviewed within the next 3-5 years or as soon as RFID at item level is used widely.

Bibliography

ISO/IEC 19762-3:2005, Information technology - Automatic identification and data capture (AIDC) techniques - Harmonized vocabulary - Part 3: Radio frequency identification (RFID)

Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) - Joint declaration of the European Parliament, the Council and the Commission relating to Article 9, Official Journal L 037, 13/02/2003 P. 0024 - 0039

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Annex A
(informative)

CECED report
ELECTRONIC PRODUCT IDENTIFICATION
A Study into the feasibility of technologies that enable
the identification of producer and product characteristics

GENERICS

ELECTRONIC PRODUCT IDENTIFICATION
A Study into the feasibility of technologies that enable the identification of producer and product characteristics

CECED

FINAL VERSION

iTeh STANDARD PREVIEW
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EPI Final Report

GENERICS

EXECUTIVE SUMMARY

This report has been produced for CECED by Scientific Generics Ltd., Cambridge, England. The report is a study into the feasibility of using technologies that enable the identification of producer and product characteristics in order to address the EU directives regarding waste electrical and electronic equipment (WEEE) and the restriction of the use of hazardous substances.

The study comprised four main sections of work:

- Tagging System Requirements

- A technology review

- An examination of other benefits

- A cost/benefit model

Data was compiled from CECED members and other stakeholders such as disposal companies and local authorities. Market data was supplied by CECED and combined with other sources of public information. Information regarding equipment and costs was obtained from system suppliers.

The results of the studies are included in the appendices and an overview presented in the main summary document.

The key conclusions are:

- No tagging system currently available or available in the foreseeable future will meet the current operational requirements for disposal and logistics of WEEE.

- There is no clear financial case for adopting a tagging system in the short term (10-15 years). Having made substantial up-front investment then tagging may offer financial benefit over a 20 year plus period for large goods.

- The major hurdle to adoption of tagging is the acceptance of the investment and operational changes required by other stakeholders such as disposal companies and local authorities.

The key recommendations are:

- Do not adopt a tagging solution to address WEEE and RoHS for the present

- Investigate other means of management of disposal costs associated with the WEEE directive, for example sampling.

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APPENDICES

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