

English Version

**Electronic Fee Collection - Assessment of security
measures for applications using Dedicated Short-Range
Communication**

Elektronische Gebührenerhebung - Beurteilung von
Sicherheitsmaßnahmen für Anwendungen mit
dedizierter Nahbereichskommunikation

This Technical Report was approved by CEN on 11 April 2016. It has been drawn up by the Technical Committee CEN/TC 278.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword.....	4
Introduction	5
1 Scope	6
2 Terms and definitions	6
3 Abbreviations	9
4 Method	10
5 Security Objectives and Functional Requirements.....	13
5.1 Target of evaluation	13
5.2 Security objectives.....	14
5.2.1 Introduction	14
5.2.2 Confidentiality.....	14
5.2.3 Availability	14
5.2.4 Accountability	14
5.2.5 Data integrity.....	14
5.3 Functional security requirements	15
5.3.1 Introduction.....	15
5.3.2 Confidentiality.....	15
5.3.3 Availability	17
5.3.4 Accountability	18
5.3.5 Data integrity.....	20
5.4 Inventory of assets.....	21
5.4.1 Functional Assets	21
5.4.2 Data Assets.....	22
6 Threat analysis.....	22
7 Qualitative risk analysis	24
7.1 Introduction	24
7.1.1 General.....	24
7.1.2 Likelihood of a threat	24
7.1.3 Impact of a threat.....	25
7.1.4 Classification of Risk	26
7.2 Risk determination.....	26
7.2.1 Definition of high and low risk context.....	26
7.2.2 Threat T1: Access Credentials keys can be obtained	27
7.2.3 Threat T2: Authentication keys can be obtained	27
7.2.4 Threat T3: OBU can be cloned	28
7.2.5 Threat T4: OBU can be faked.....	28
7.2.6 Threat T5: Authentication of OBU data can be repudiated.....	29
7.2.7 Threat T6: Application data can be modified after the transaction	29
7.2.8 Threat T7: Data in the VST is not secure.....	30
7.2.9 Threat T8: DSRC Communication can be eavesdropped.....	30
7.2.10 Threat T9: Correctness of application data are repudiated	31
7.2.11 Threat T10: Master keys may be obtained from RSE	31
7.3 Summary	31

8	Proposals for new security measures	32
8.1	Introduction.....	32
8.2	Security measures to counter risks related to key recovery.....	32
8.3	Recommended countermeasures	34
8.4	Qualitative cost benefit analysis	35
9	Impact of proposed countermeasures	35
9.1	Current situation and level of fraud in existing EFC systems using CEN DSRC link.....	35
9.2	EETS legislation	36
9.3	Analysis of effects on existing EFC systems.....	36
9.3.1	Affected roles	36
9.3.2	The CEN DSRC equipment Manufacturers	36
9.3.3	The Toll Service Providers	37
9.3.4	The Toll Chargers	37
10	Recommendations.....	38
10.1	Add security levels and procedures to EN ISO 14906.....	38
10.2	Recommendation for other EFC standards	39
10.3	New standards	39
Annex A (informative)	Current status of the DEA cryptographic algorithm	40
A.1	Overview	40
A.2	ISO/IEC 9797-1 (MAC Algorithm 1).....	40
A.3	FIPS 46 (DEA Specification – DES)	40
A.4	ENISA recommendations	41
Annex B (informative)	Security considerations regarding DSRC in EFC Standards	42
B.1	Security vulnerabilities in EN 15509 and EN ISO 14906	42
B.2	Security vulnerabilities in EN ISO 12813 (CCC)	42
B.3	Security vulnerabilities in EN ISO 13141 (LAC).....	43
B.4	Security vulnerabilities in CEN/TS 16702-1 (SM-CC)	43
Bibliography		44

European foreword

This document (CEN/TR 16968:2016) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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Introduction

Security for dedicated short-range communication (DSRC) applications in the context of electronic fee collection (EFC) has a long history in standardization. Currently the area is covered by several standards and technical specifications, successively developed over time:

- EN ISO 14906 (Electronic fee collection - Application interface definition for dedicated short-range communication) provides a toolbox of functions and security measures which can be used for DSRC application.
- CEN ISO/TS 19299 (Electronic fee collection - Security framework) analyzes the threats to an EFC system as a whole, and not specifically for the DSRC technology.
- EN ISO 12813 (Electronic fee collection - Compliance check communication for autonomous systems) and EN ISO 13141 (Electronic fee collection - Localisation augmentation communication for autonomous systems) mirrors the best-practice security measures of EN 15509.
- CEN/TS 16702-1 (Electronic fee collection - Secure monitoring for autonomous toll systems - Part 1: Compliance checking) provides an EFC enforcement concept, partially dependent on a DSRC application.
- EN 15509 (Electronic fee collection - Interoperability application profile for DSRC) defines an interoperable application profile which comprises a selection of such measures with a definition of security algorithms associated to it. It is based on the experience of many EU projects related to DSRC-EFC.

As the security domain has evolved, it is now necessary to analyze again the threats, vulnerabilities and risks of using the CEN DSRC technology in all DSRC-based applications related to EFC. Technological advances and proliferation of cryptographic tools and knowledge has made an attack on the security procedures of DSRC more likely.

This technical report (TR) identifies context dependent risks on the DSRC link and proposes security measures to counter them and the points out what new standard deliverables that are needed.

1 Scope

This Technical Report includes a threat analysis, based on CEN ISO/TS 19299 (EFC - Security Framework), of the CEN DSRC link as used in EFC applications according to the following Standards and Technical Specification

- EN 15509:2014,
- EN ISO 12813:2015,
- EN ISO 13141:2015,
- CEN/TS 16702-1:2014.

This Technical Report contains:

- a qualitative risk analysis in relation to the context (local tolling system, interoperable tolling environment, EETS);
- an assessment of the current recommended or defined security algorithms and measures to identify existing and possible future security leaks;
- an outline of potential security measures which might be added to those already defined for DSRC;
- an analysis of effects on existing EFC systems and interoperability clusters;
- a set of recommendations on how to revise the current standards, or proposal for new work items, with already made implementations taken into account.

The security analysis in this Technical Report applies only to Security level 1, with Access Credentials and Message authentication code, as defined in EN 15509:2014.

It is outside the scope of this Technical Report to examine Non DSRC (wired or wireless) interfaces to the OBE and RSE.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

access credentials

trusted attestation or secure module that establishes the claimed identity of an object or application

[SOURCE: EN 15509:2014, 3.1]

2.2

accountability

property that ensures that the actions of an entity may be traced uniquely to that entity

[SOURCE: ISO 7498-2:1989, 3.3.3, modified]