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Irish Standard
I.S. EN 16312:2013

Intelligent transport systems - Automatic Vehicle and Equipment Registration (AVI/AEI) - Interoperable application profile for AVI/AEI and Electronic Register Identification using dedicated short range communication

I.S. EN 16312:2013

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EUROPEAN STANDARD

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EN 16312

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English Version

Intelligent transport systems - Automatic Vehicle and Equipment Registration (AVI/AEI) - Interoperable application profile for AVI/AEI and Electronic Register Identification using dedicated short range communication

Systèmes de transport intelligents - Identification automatique des véhicules et des équipements (AVI/AEI) - Profil d'application d'interopérabilité pour AVI/AEI et identification d'enregistrement électronique en utilisant des systèmes de communication dédiés à courte portée

Intelligente Transportsysteme - Automatische Fahrzeug und Ausstattungsregistrierung (AVI/AEI) - Interoperables Anwendungsprofil für AVI/AEI und elektronische Registrierungsidentifikation unter Verwendung von dedizierter Nahbereichskommunikation

This European Standard was approved by CEN on 27 October 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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EN 16312:2013 (E)

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I.S. EN 16312:2013

EN 16312:2013 (E)

Foreword

This document (EN 16312:2013) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This draft European Standard defines an Application Profile based on a set of base standards according to the concept of "International Standardised Profiles (ISP)" as defined in ISO/IEC TR 10000-1. The objective is to support technical interoperability between AVI/AEI DSRC-based systems. The principles of Application Profiling and relations to underlying base standards are defined in the Introduction.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

CEN/TC 278 has produced a set of standards that supports interoperable automatic vehicle identification and automatic equipment identification using dedicated short-range communication (DSRC)-based systems (e.g. EN ISO 17264:2009, a "toolbox" for defining automatic vehicle identification and automatic equipment identification (AVI/AEI)-application transactions). However, these standards are necessary but not sufficient to ensure technical interoperability. This European Standard provides for a coherent set of requirements of the AVI/AEI-application intended to serve as a common technical platform for AVI/AEI-interoperability.

This European Standard defines an Interoperable Application Profile for AVI/AEI and electronic registration identification (ERI) using CEN DSRC-. The main objective is to support technical interoperability between ERI systems within the scope of the standard (as defined in Clause 1 below). This includes equipment compatibility between equipment suppliers and technical compatibility between different AVI/AEI systems compliant with this standard. This Standard is based on AVI/AEI standards such as ISO 14816, ISO 17264 and ISO 24534. Therefore, this Interoperable Application Profile enables other AVI/AEI application implementations to use the elements of this Standard as a basis for technical interoperability.

In order to enable multipurpose equipment where AVI/AEI applications share resources with other applications such as EFC, this standard is patterned on EN 15509:2007, which is the interoperability application profile for EFC over CEN DSRC. This ensures that the AVI/AEI application implementations feature equivalent services as EFC.

This European Standard only defines a basic level of technical interoperability for ERI equipment, i.e. Electronic Registration Tag (ERT) and ERI Reader/Writer (ERR) using DSRC. It does not provide a full solution for interoperability, and it does not define other parts of the EFC-system, other services, other technologies and non-technical elements of interoperability.

Although there are already numerous existing base standards and specifications, there are specific needs that motivate this Interoperable Application Profile standard. This standard:

— defines the necessary and sufficient -DSRC requirements to support technical interoperability;

— enables multi-application equipment;

— fulfils the necessary additional DSRC-requirements;

— provides a choice of data elements including vehicle data;

— gives an extended definition of the use of some data elements, including semantics and coding;

— lays down clear choices for security implementation;

— facilitates a complementing test specification (with clear relations between the conformance requirements; and evaluation tests);

— provides good support for procurements.

The Application Profile is described using the concept of "International Standardised Profiles (ISP)" as defined in ISO/IEC TR 10000-1. The ISP-concept is specifically suited for defining interoperability specifications where a set of base standards can be used in different ways. This is exactly the case in AVI/AEI, where a set of toolbox base standards allows for different choices that are not interoperable.

The principles of the ISP-concept can be summarised as follows:

— an ISP shall make references only to base standards or other ISPs;

— the profile shall restrict the choice of base standard options to the extent necessary to maximize the probability of interoperability (e.g. chosen classes, conforming subsets, options and parameter values of base standards);

— the ISP shall not copy content of the base standards (in order to void consistency problems with the base standards);

— the profile shall not specify any requirements that would contradict or cause non-conformance to the base standards;

— the profile may contain conformance requirements that are more specific and limited in scope than those of the base standards;

— conformance to a profile implies by definition conformance to a set of base standards, whereas conformance to that set of base standards does not necessarily imply conformance to the profile.

On this background, this Standard uses the structure and approach of existing IAP definitions, such as EN 15509:2007, made by other ITS application working groups.

The Interoperable Application Profile is defined in terms of conformance requirements as given in Clause 5. To facilitate easy referencing, testing and look-up, these requirements are divided into two parts; Electronic Registration Tag (ERT) requirements (5.1) and ERI Reader/Writer (ERR) requirements (5.2).

In addition, the standard also includes various annexes that provide further detailed specifications as well as background, motivation and examples for the conformance requirements. The intention is that these enhance readability and understanding of the standard.

This European Standard is complemented by a set of standards defining Conformity Evaluation of the Conformance Requirements for Layer 1, Layer 2 and Layer 7 of the CEN DSRC Stack and elements of the application definition in this European Standard, patterned on EN 15509:2007.

1 Scope

The scope for this European Standard is limited to:

— physical systems: ERT, ERR and the DSRC interface between them (all functions and information flows related to these parts);

— DSRC-link requirements;

— ERI session over the DSRC interface;

— data elements to be used by ERT and ERR used in ERI session;

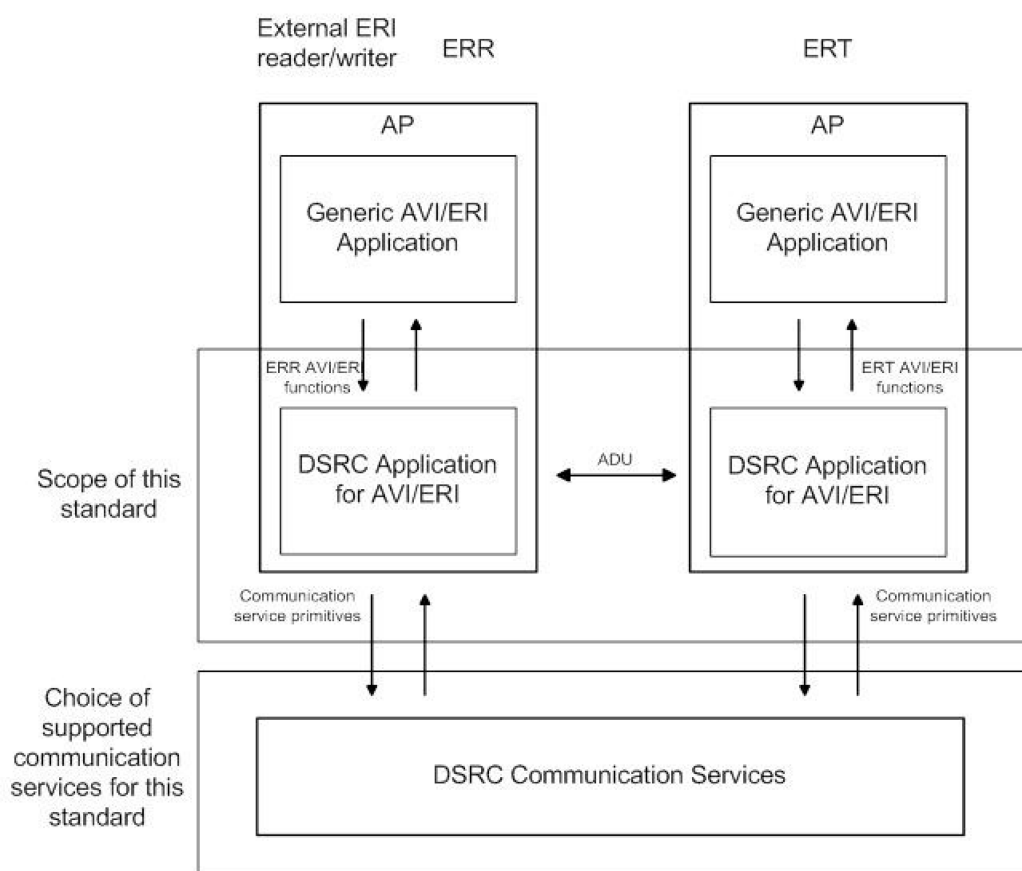— security mechanisms for ERT and ERR used in ERI session.

Figure 1 — Scope for this European Standard

It is outside the scope of this European Standard to define:

— contractual and procedural interoperability requirements;

— provisions for electronic payments such as EFC;

— conformance procedures and test specification;

— setting-up of operating organisations (e.g. application service provider, issuing, trusted third party etc.);

— legal issues;

— use of other communication technologies (e.g. RFID such as ISO 18000 series); and

— other interfaces or functions in ERI-systems than those specified above (i.e. information flows and data exchange between ERI Application providers or personalisation, initialisation and customisation of the OBU).

Some of these issues are subject to separate standards prepared by CEN/TC 278, ISO/TC 204 or ETSI ERM.

The following figure shows the scope of this European Standard from a DSRC-stack perspective.
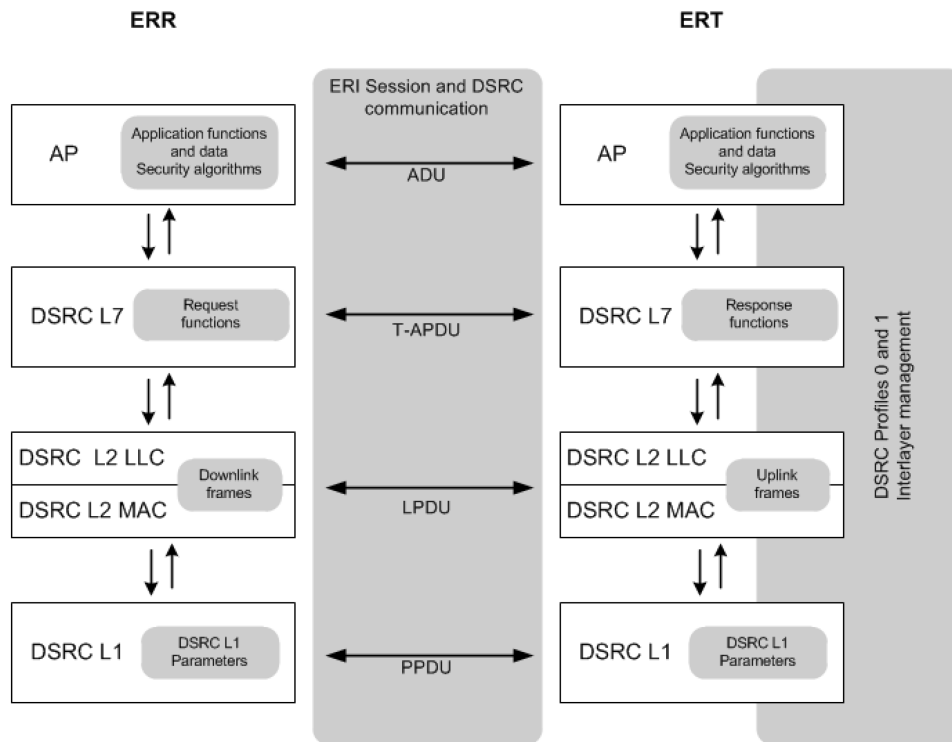

Figure 2 — Relations between this European Standard and DSRC-stack elements

NOTE   For interlayer management, see EN 15509:2007, Annex G.

This European Standard defines an Application Profile based on the ISP-concept. The base standards that this Application Profile is based upon are:

— EN ISO 14906:2011 and ISO 17264:2009 on ERI application interface definition for DSRC (this implies indirect references to EN ISO 14816 on Numbering and data structures);

— EN 12834: on DSRC application layer (L7);

— EN 13372 on DSRC profiles (this implies indirect references to the DSRC L1, L2 and L7 standards: EN 12253, EN 12795 and EN 12834);

— EN 15509:2007: Interoperable Application Profile for EFC using CEN DSRC;
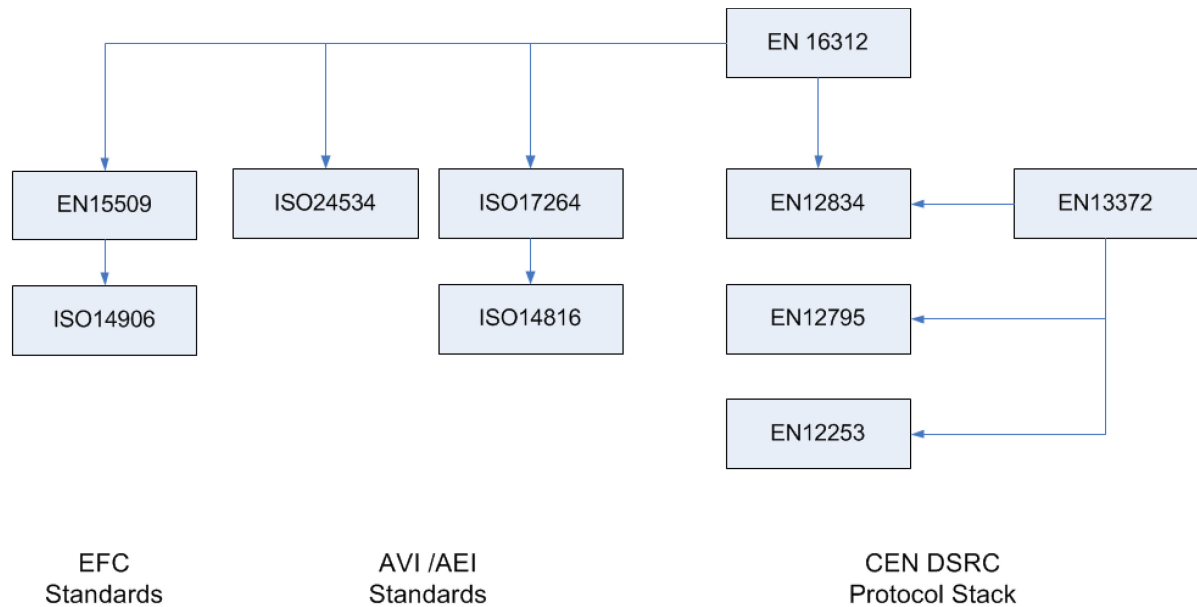
— ISO 24534 on ERI application.

Figure 3 — Relation and references between base standards and EN 16312 (this European Standard)

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12834, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

EN 13372, *Road Transport and Traffic Telematics (RTTT) — Dedicated short-range communication — Profiles for RTTT applications*

EN 15509:2007*, Road transport and traffic telematics — Electronic fee collection — Interoperability application profile for DSRC*

EN ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure (ISO 14816)*

EN ISO 14906:2011, *Electronic fee collection — Application interface definition for dedicated short-range communication (ISO 14906:2011:2011)*

EN ISO 17264:2009, *Intelligent transport systems - Automatic vehicle and equipment identification — Interfaces (ISO 17264:2009)*

ISO/IEC 9646-7, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation Conformance Statements*

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