Road transport and traffic telematics - Automatic vehicle and equipment identification - Numbering and data structure

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 14816:2005 sisaldab Euroopa standardi EN ISO 14816:2005 ingliskeelset teksti. Käesolev dokument on jõustatud 28.12.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 14816:2005 consists of the English text of the European standard EN ISO 14816:2005. This document is endorsed on 28.12.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This International Standard establishes a common framework data structure for unambiguous identification in RTTT/ITS systems. It excludes any physical aspects such as interfaces. It is neither frequency- nor air interface protocol-specific.	**Scope:** This International Standard establishes a common framework data structure for unambiguous identification in RTTT/ITS systems. It excludes any physical aspects such as interfaces. It is neither frequency- nor air interface protocol-specific.

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Road transport and traffic telematics - Automatic vehicle and equipment identification - Numbering and data structure (ISO 14816:2005)

Télématique de la circulation et du transport routier - Identification automatique des véhicules et équipements - Codification et structure des données (ISO 14816:2005)

Telematik für den Straßenverkehr und Transport - Automatische Identifizierung von Fahrzeugen und Geräten - Nummerierung und Datenstrukturen (ISO 14816:2005)

This European Standard was approved by CEN on 28 October 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 14816:2005) has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 204 “Transport information and control systems”.

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 May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006

This document supersedes EN ISO 14816:2000.

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

INTERNATIONAL STANDARD

ISO 14816

First edition
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Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure

Télématique de la circulation et du transport routier — Identification automatique des véhicules et équipements — Codification et structure des données

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 14816 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with Technical Committee CEN/TC 278, *Road transport and traffic telematics*.

This first edition cancels and replaces (ISO/TS 14816:2000).

Introduction

This International Standard specifies a data structure that enables upwards integration and expansion from the simplest low-cost AVI/AEI system to more complex functions. The structure is designed to be flexible and enabling rather than prescriptive.

This International Standard has been designed to provide for the differing requirements of AVI and AEI by the use of separate application specifics. By retaining these differing requirements within one supervisory document, the interoperability is maximized, particularly in the case where both AVI and AEI are required at the same time in the road environment.

In order to support systems using both active and passive On Board Equipment (OBE), the basic data structures have been minimized. This enables any manufacturer/operator with an OBE with a user addressable memory of only 56 bits to be able to conform to a full core identification according to this International Standard.

Abstract Syntax Notation One (ASN.1) is widely applied. Its usage provides maximum interoperability and conformance to existing International Standards, and meets the specifically defined requirements for a generic standard model for RTTT in that it:

— Uses existing standard Syntax Notation and Encoding Rules,

— Is adaptable and expandable,

— Does not include unnecessary information for a specific system, and

— Incurs a minimum of overhead in storage and transmission.

Readers who are unfamiliar with ASN.1 are advised to read ANNEX C before reading the main body of this International Standard. Readers are also advised to read ISO/IEC 8824, ISO/IEC 8825-1, ISO/IEC 8825-2 and ISO/IEC 8825-3 and other published work on ASN.1 before reading the main body of this International Standard.

ISO 14814 provides a reference architecture model for AVI/AEI systems.

Sections 4.1-4.6 of ISO 14816 provide a standardized yet flexible and interoperable framework for numbering schemes. A structure for AVI/AEI unambiguous identification and several numbering schemes associated with AVI/AEI systems are determined in this International Standard.

The core AVI/AEI numbering scheme, central to the effective use of many of the constructs, is a structure to provide unambiguous identification. 4.7 of this International Standard provides a data element coding for Automatic Vehicle and Equipment Identification (AVI/AEI) in RTTT applications. This coding provides a structure with the possibility of 2^{56} (in excess of 72 million billions) unique identifiers, provided within a 56-bit code structure when ISO/IEC 8825-2 (PER) is used, i.e. no overhead is incurred.

Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure

1 Scope

1.1 Overall numbering scheme

This International Standard establishes a common framework data structure for unambiguous identification in RTTT/ITS systems. It excludes any physical aspects such as interfaces. It is neither frequency- nor air interface protocol-specific.

Data elements that form part of transmission or storage protocols such as headers, frame markers and checksums are thus excluded.

The specifications for protecting against changes, classifying and qualifying security aspects of the data structure elements are not included within this International Standard.

The principles of data element structure and description determined in ISO/IEC 8824, ISO/IEC 8825-1 and ISO/IEC 8825-2 have been adopted to provide an interoperable architecture within a standard framework according to guidelines from ISO/TC 204 and CEN/TC 278.

This International Standard defines data structures based on the ISO/IEC 8824-1 ASN.1 `UNIVERSAL CLASS` types that may be directly `IMPORTED` to other application standards that would need only subsets of the full `APPLICATION CLASS` types. These `UNIVERSAL CLASS` and `APPLICATION CLASS` types are uniquely defined as an ASN.1 module in Annex B. This module may be directly linked into an application data definition.

This International Standard defines default encoding for simple AVI/AEI applications where no other relevant application standard exists. This definition forms Clause 4.

1.2 AVI/AEI numbering scheme

The principal registered schemes for AVI/AEI are determined in 4.7 and 4.8 of this International Standard. Other relevant and interoperable schemes are detailed in subsequent clauses and subclauses.

The structures defined in this International Standard provide interoperability, not only between simple AVI/AEI and more complex RTTT/ITS functions, but also with pre-existing International Standards (e.g. ISO 10374).

There is one Central Registration Authority that administers the AVI numbering scheme according to the rules of CEN and ISO (see Annex A).

The choices available to the issuer to operate its structure include, amongst others:

— simple identification, in which case the separate identities may be openly available, at the discretion of the issuer or nation state;

— an alias basis, in which case the “identities” are known, but secured under provisions of data protection to maintain privacy and therefore not available; and

— dynamically encrypted identities in an anonymous system.

2 Normative references

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

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 3779, *Road vehicles — Vehicle identification number (VIN) — Content and structure*

ISO 3780, *Road vehicles — World manufacturer identifier (WMI) code*

ISO 6346, *Freight containers — Coding, identification and marking*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*

ISO/IEC 8825-1, *Information technology — ASN.1 encoding rules — Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 8825-2, *Information technology — ASN.1 encoding rules — Part 2: Specification of Packed Encoding Rules (PER)*

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No.1*

ISO/IEC 8859-2, *Information technology — 8-bit single-byte coded graphic character sets — Part 2: Latin alphabet No. 2*

ISO/IEC 8859-3, *Information technology — 8-bit single-byte coded graphic character sets — Part 3: Latin alphabet No. 3*

ISO/IEC 8859-4, *Information technology — 8-bit single-byte coded graphic character sets — Part 4: Latin alphabet No. 4*

ISO/IEC 8859-5, *Information technology — 8-bit single-byte coded graphic character sets — Part 5: Latin/Cyrillic alphabet*

ISO/IEC 8859-6, *Information technology — 8-bit single-byte coded graphic character sets — Part 6: Latin/Arabic alphabet*

ISO/IEC 8859-7, *Information technology — 8-bit single-byte coded graphic character sets — Part 7: Latin/Greek alphabet*

ISO/IEC 8859-8, *Information technology — 8-bit single-byte coded graphic character sets — Part 8: Latin/Hebrew alphabet*

ISO/IEC 8859-9, *Information technology — 8-bit single-byte coded graphic character sets — Part 9: Latin alphabet No. 5*

ISO/IEC 8859-10, *Information technology — 8-bit single-byte coded graphic character sets — Part 10: Latin alphabet No. 6*

ISO 10374, *Freight containers — Automatic identification*

ISO/IEC 10646-1, *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane*

ISO/TR 14813-3, *Transport information and control systems — Reference model architecture(s) for the TICS sector — Part 3: Example elaboration*

ISO 14814, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Reference architecture and terminology*

3 Terms, definitions and notations

For the purposes of this document, the terms and definitions given in ISO 14814 apply.

The term “Issuer” applies to any of the coding schemes CS1, CS2 and CS8.

Numerical notations are represented as follows:

— Decimal (“normal”) notation has no subscript.

EXAMPLE 127.

— Hexadecimal numbers are noted by subscript 16.

EXAMPLE Example: $7F_{16}$.

— Binary numbers are noted by subscript 2.

EXAMPLE Example: 01111111_2.

Characters are represented as follows:

— Characters have no subscript or quotes.

EXAMPLE ABC5EFD.

4 Requirements

4.1 Overall coding structure

The AVI/AEI coding structure determined in this International Standard:

— is unambiguous and flexible enough to include relevant transport related numbering schemes,

— follows relevant International Standards, available at the time of writing,

— provides an exact coding of the data elements,

— is extendible to enable future expansion, and

— is able to accommodate private structures.

4.2 General requirements

The coding structure determined in this International Standard is an “enabling” structure. It is designed to accommodate, within its framework, coding structures for a variety of RTTT/ITS systems from simple AVI/AEI to more complex transactions with a wide variety of uses, and to allow combinations of data elements to be used in a composite data construct. It is designed to allow as much interoperability of the data elements within