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Inteligentni transportni sistemi - Sistemi za odkrivanje ukradenih vozil - 3. del: Vmesnik in zahteve za potrebe sistema za komunikacijo kratkega dosega

Intelligent transport systems - After-theft systems for the recovery of stolen vehicles - Part 3: Interface and system requirements in terms of short range communication system

Intelligente Transportsysteme - Systeme für das Wiederfinden gestohlener Fahrzeuge - Teil 3: Schnittstellen- und Systemanforderungen für Nahbereichskommunikationssysteme

Systèmes de transport intelligents - Systèmes intervenant après un vol pour la récupération des véhicules - Partie 3: Spécifications d'interface et de système pour les communications à courte portée

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Intelligent transport systems - After-theft systems for the recovery of stolen vehicles - Part 3: Interface and system requirements in terms of short range communication system

Systèmes de transport intelligents - Systèmes intervenant après un vol pour la récupération des véhicules - Partie 3: Spécifications d'interface et de système pour les communications à courte portée

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This European Standard was approved by CEN on 26 April 2013.

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Foreword

This document (EN 15213-3:2013) 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of an identical text or by endorsement, at the latest by December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.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 document supersedes CEN/TS 15213-3:2006.

It is derived from a suite of CEN Technical Specifications CEN/TS 15213-1 to -6 inclusive dealing with the tracking and recovery of stolen vehicles. Parts 1 to 5 inclusive have been upgraded to EN status without change. CEN/TS 15213-6:2011 remains a valid Technical Specification as of the date of this publication and will be considered for EN status in due course. All these documents remain related and should be read in conjunction according to the type of technology, product or service being considered.

EN 15213 consists of the following parts:

— EN 15213-1, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 1: Reference architecture and terminology*;

— EN 15213-2, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 2: Common status message elements*;

— EN 15213-3, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 3: Interface and system requirements in terms of short range communication system* (the present document);

— EN 15213-4, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 4: Interface and system requirements in terms of long range communication system*;

— EN 15213-5, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 5: Messaging interface*;

— CEN/TS 15213-6, *Road transport and traffic telematics — After-theft services for the recovery of stolen vehicles — Part 6: Test procedures*[1)].

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

1) Part 6 awaits final evaluation and ratification as EN and until such time remains a valid part of this EN as CEN/TS 15213-6:2011.

Introduction

This European Standard was developed by CEN/TC 278 "Road transport and traffic telematics", Working Group 14 (WG 14) on the subject of After Theft Systems for Vehicle Recovery (ATSVR).

WG 14 comprised representatives and experts from police, insurance associations (CEA), car manufacturers, transport associations, vehicle rental associations and ATSVR system and product providers. The work was also in cooperation with Europol and the European Police Cooperation Working Group (EPCWG).

This European Standard was developed to define an architecture within guidelines from CEN/TC 278 through which a level of interoperability can be achieved between Systems Operating Centres (SOC) and Law Enforcement Agencies (LEA), both nationally and internationally.

This will provide minimum standards of information and assurance to users as to the functionality of systems, thereby enabling the recovery of vehicles, detection of offenders and a reduction in crime.

This European Standard refers to the potential development of systems to enable law enforcement agencies to remotely slow and/or stop the engines of stolen vehicles. This situation remains and further information is available in 2012 CEN publication N2643 Feasibility Report on Remote Slow and Stop Technology, available from CEN/TC 278.

This document should be read in conjunction with EN 15213-1 which provides the preliminary framework for ATSVR concepts.

1 Scope

This European Standard focuses on Short Range (SR) Interface/Systems Requirements. SR systems use an interface that allows Detection Equipment to operate some ATSVR functions in the direct line of sight of vehicles.

SR systems enable LEAs in a particular country, to permit LEA personnel to perform actions on vehicles that are within their immediate vicinity. Such actions can include identification of vehicle data or influencing the vehicle from a remote site.

Standards for Automatic Vehicle Identification (AVI) and Automatic Equipment Identification (AEI) are being developed by CEN/TC 278/WG 12 in parallel with ISO/TC 204/WG 4. This ATSVR specification does not prejudice those standards and does not seek to establish parameters for future AVI/AEI standards. DSRC and AVI Standards are seen as basic technology blocks for types of short range ATSVR.

This part of EN 15213 describes the structure, bit arrangements, number representation and coding of message elements that are typically transmitted as data. There is no requirement to make the messages as short or as effective as possible. Emphasis is placed on making them as clear and unambiguous as possible.

For Short Range Communications, where there is very little time available for the transfer of data between passing vehicles and detection equipment, only a subset of the message elements described in this document can be transmitted. Therefore, in these cases, the data lengths are reduced to an absolute minimum.

Data elements such as times, dates, or geographical coordinates need not be transmitted because the ATSVR consists of various equipment elements that communicate and interact through various interfaces in accordance with standard procedures and protocols facilitating the recovery of stolen vehicles. These processes may involve a human operator.

ATSVR elements include the OBE installed in the vehicles, a range of Detecting Equipment and one or more System Operating Centres. One or more supporting Infrastructure Networks provides communications to support the ATSVR. The ATSVR location function may also include one or more supporting Position Reference Sources.

Some Short Range devices may be triggered by or may use long range communications and vice versa.

Some Interfaces are not within the scope of this EN. These comprise interfaces to or from sensors, actuators and human operators; from position reference sources, e.g. GPS, LEAs internal interfaces, etc.

Detection Equipment "knows" the time; in case of stationary equipment, it "knows" its coordinates, etc. The Detection Equipment may concatenate these data elements to the data coming from the vehicle, when sending a complete data set to ATSVR System Operating Centres or to LEA as described in other parts of this EN.

Wherever possible the same specifications, data structures, contents, and definitions have been used throughout this EN. This EN does not seek to define the requirements or actions of the various human elements of the ATSVR, but it does aim to identify the interactions and interfaces that exist amongst the equipment and human elements operating within the system.

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 12253, *Road transport and traffic telematics — Dedicated short-range communication — Physical layer using microwave at 5,8 GHz*

EN 12795, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC Data link layer: medium access and logical link control*

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 15213-1:2013, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 1: Reference architecture and terminology*

EN 15213-2:2013, *Intelligent transport systems — After-theft systems for the recovery of stolen vehicles — Part 2: Common status message elements*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15213-1:2013 and the following apply.

3.1
AEI
automatic equipment identification
process of identifying equipment or entities that use surface transportation infrastructures by means of OBE's combined with the unambiguous data structure defined in these standards

3.2
AIS
automatic identification system
system for achieving accurate and unambiguous identification of a data bearing OBE, tag, transponder or a natural/prescribed feature, the data or feature being interrogated by means of a system appropriate source

3.3
carrier signal
electromagnetic signal that can be modulated to carry lower frequency encoded information across an air interface

3.4
constructed identifier
identification which requires a construct of more than one primitive identifier, as defined in ASN.1

3.5
data element structure
framework comprising a number of data elements in a prescribed form

3.6
identification function
unequivocal identification of vehicles, including those that are not stolen, permitted by the vehicle's country of origin or registration

3.7
OBE status
status of on board equipment (1 byte)

3.8
operator
commercial operator of an AVI/AEI/RTTT system that uses OBEs for the purposes defined in EN ISO 14814

3.9
primitive identifier
identification as a stand alone identity that does not require any qualifiers such as an expiration date, etc.

Note 1 to entry: All construct identifiers will be built from more than one primitive identifier.

3.10
remote activation
electronic communication to the vehicle that is stolen, setting certain bits of information in the vehicle

3.11
remote degradation
potential to degrade from a remote site, the vehicle's engine performance so as to significantly reduce the speed or cause the thief to park or abandon the vehicle

3.12
session time
4 bytes; coding defined in EN ISO 14906

3.13
short range after theft system for vehicle recovery
ATSVR SR
system, within the line of sight or similar short range, that communicates and interacts in accordance with standard procedures and transmission protocols to facilitate the recovery of a Registered Stolen Vehicle

3.14
SR detection by consulting
process by which Detection Equipment electronically "consults" passing vehicles for an identity and compares them against a database of stolen vehicles

3.15
SR detection by signalling
process by which the stolen vehicle, after a wireless activation process, "signals" to Detection Equipment that it is stolen

3.16
telegram
short message data

3.17
vehicle service table
VST
information block from the OBE to the RSE during initialisation

4 Symbols and abbreviations

A1	EU project
ASN.1	Abstract Syntax Notation one
ATSVR	After Theft System for Vehicle Recovery
AttrID	attribute identifier

Auth	authenticator
AVI / AEI	Automatic Vehicle Identification/Automatic Equipment Identification
CBC	Cipher Block Chaining
[CEN_AI]	EN ISO 14906: EFC **a**pplication **i**nterface
[CEN_L1]	EN 12253 DSRC **l**ayer**1** Physical layer using 5,8 GHz
[CEN_L2]	EN 12795 DSRC **l**ayer**2** Data link layer
[CEN_L7]	EN 12834 DSRC **l**ayer**7** Application layer
[CEN_Pr]	EN 13372 DSRC **Pr**ofiles
DE	Detection Equipment
DES	Data Encryption Standard (see also TDES)
DSRC	Dedicated Short Range Communication
EDI	Electronic Data Interchange

NOTE Within this context, an EDI message is normally compatible with the form specified in ISO 9897 (CEDEX).

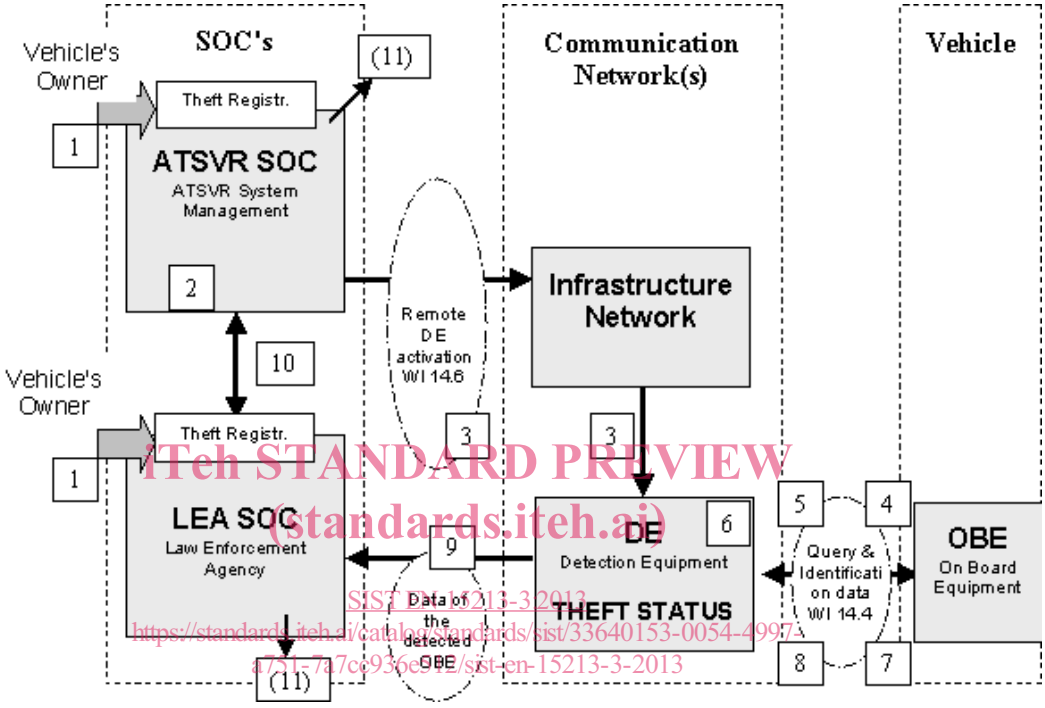
EDT	Electronic Data Transfer
EFC	Electronic Fee Collection
EID	Element ID
GSS	Global specifications for short range communication
LEA	Law Enforcement Agency (see EN 15213-1)
LR	Long Range
MAC	Message Authentication Code
OBE	On Board Equipment
RndOBE	Random number form OBE to RSE
RndRSE	Random number from RSE to OBE
RSE	Road Side Equipment
RTTT	Road Transport and Traffic Telematics
SOC	System Operating Centre
TDES	Triple DES
VST	Vehicle Service Table

5 Requirements for Short Range Operations

5.1 Detailed Architecture Diagrams and Sequence Diagrams

5.1.1 Detection by CONSULTING Architecture Diagram

This diagram depicts *one* subset of the general ATSVR Architectural Diagram. It shows the Operating Centres, Communication Network including the DE, and the vehicle with its OBE together with data streams and interfaces.



Key

1) Theft shall be reported to the LEA SOC either directly or via an ATSVR SOC.
2) "Reported to be stolen" information is kept by the ATSVR SOC.
3) When the Theft Registration has been reported, the DE is activated (updating the DE data file) either at LEA SOC before being deployed, or remotely via Long Range Infrastructure Network.
4) DE interrogates the OBEs of vehicles in the vicinity ("consulting").
5) OBE sends back the VIN and theft status of the vehicle (or encrypted information from which VIN and status can be derived).
6) DE compares data from the OBE with its data file of stolen vehicles and determines whether the vehicle is reported as stolen.
7) If the DE has determined that the vehicle status information has to be updated, it sends the appropriate data to the OBE.
8) Acknowledgement that OBE has been updated is reported back and logged in the DE.
9) Data of the detected vehicle together with status information is sent to the LEA SOC.
10) This information is subsequently routed to the ATSVR SOC to update their files.
11) Beyond these *technical* requirements: LEA SOC or the ATSVR SOC may take appropriate action.

Figure 1 — Detection by CONSULTING Architecture Diagram

5.1.2 Detection by CONSULTING Sequence Diagram

Detection by Consulting is where an external item of DE interrogates the OBE and the OBE responds by transmitting data to the DE. The DE then compares the received data with a database of Registered Stolen Vehicles. A data match confirms that a Registered Stolen vehicle is present and further action can take place.

This function is especially needed for controls at the roadside, border, harbour, entrance to a parking area, etc. using stationary DEs. In order to support these activities a fast identification-function is provided. The transmission of the VIN and the theft-status is sufficient. All other relevant data about the vehicle can be obtained from the vehicles database. The theft-status in the OBE can be changed via the remote activation function.

Transmission of the theft-status from the OBE to the DE is important because it permits the use of simple DE without connections to a central database of stolen vehicles. It is a pre-requisite that the theft-status of the OBE is up-to-date.

Table 1 shows the main events for the case of detection by consulting.

Table 1 — Adapted sequence diagram for short range detection by consulting

Main events	LEA SOC	ATSVR SOC	Network	DE	OBE
Theft Registration					
Acknowledgement of the vehicle status					
Remote DE **Notification** by updating its file					
Polling of Identification elements by the DE from every surrounding OBE					
Detection of a vehicle: 1. showing “Theft Status” = ON; **OR**, 2. if the vehicle is registered as stolen in the DE’s database					
Report of detection; updating of the theft-status in the OBE					

5.1.3 Detection by SIGNALLING Architecture Diagram

This diagram depicts another subset of the general ATSVR Architectural Diagram. It shows the System Operating Centre(s), the Communication Network(s), including the Detection Equipment, and the Vehicle together with data streams and interfaces.