



## **DIRECTIVE 2004/52/EC AND DECISION 2009/750/EC ON THE INTEROPERABILITY OF ELECTRONIC ROAD TOLL SYSTEMS IN THE COMMUNITY**

### **NOTIFIED BODIES (NB) - EETS COORDINATION GROUP**

## **« GUIDE ON APPLICABLE STANDARDS »**

### **1. INTRODUCTION**

The European Guide for the application of Directive 2004/52/EC on the interoperability of electronic road toll systems and Decision 2009/750/EC on the definition of the European Electronic Toll Service, published a list of standards and other normative documents (including in this term Directives, Regulations, as well as draft standards) with EETS relevance.

In the years following its publication (2011), the regulatory framework has been significantly extended, creating some confusion, as well as, uncertainty about the criteria of compulsory applicability of this wide scenario of rules.

Furthermore, many international standards have been revised several times, or they have been completed through series of technical standards.

Such scenario led writing this Technical Guide, aiming to publish a complete list of standards and other documents concerning EETS constituents. Stakeholders should take into proper account this exhaustive list in order to guarantee interoperability of systems under own jurisdiction.

*Disclaimer:* while every reasonable effort has been made to insure the accuracy of the information provided, the authors cannot guarantee the completeness of the list published in this guide, nor that the list is up to date. The authors reserve the right not to be responsible for the information provided and any liability claims regarding damage caused by their use, will therefore be rejected.

### **2. GENERAL OUTLINES**

This guide is structured in two sections:

the reference regulatory framework is the core part of this document, detailing all the normative papers relevant to EETS constituents, with title, year of publication and last revision;

the Appendix may be an useful driving tool for manufacturers, service providers, as well as toll chargers, making available some reference grids associated to EETS constituents and re-assuming standards applicable to each component; normative papers are re-classified through "applicability tags", defined with attributes such as "compulsory", "recommended" for interoperability (mandatory, in practice) and "voluntary".

### **3. REGULATORY FRAMEWORK**

#### **3.1. EC DIRECTIVES**

##### **3.1.1. R&TTE DIRECTIVE 1999/5/EC:**

“Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity”

(9 March 1999)

*Remark: March 13, 2014 the European Parliament adopted the text of the new Radio Equipment Directive (RED) 2014/53/EU, applicable from 12 June 2016.*

##### **3.1.2. EMC DIRECTIVE 2004/108/EC (constituents without radio interface):**

“Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC”

(15 December 2004)

*Remark: February 26, 2014 the European Parliament adopted the text of the new EMC Directive 2014/30/EU, applicable from 20 April 2016.*

##### **3.1.3. LVD DIRECTIVE 2006/95/EC (CONSTITUENTS WITHOUT RADIO INTERFACE):**

“Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits”

(12 December 2006)

##### **3.1.4. ROHS DIRECTIVE 2011/65/EC:**

“Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment”

(8 June 2011)

##### **3.1.5. WEEE DIRECTIVE 2012/19/EU:**

“Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)”

(4 July 2012)

### 3.1.6. [AUTOMOTIVE DIRECTIVE 2009/19/EC \(on board units powered by vehicle electrical system\)](#):

“Commission Directive 2009/19/EC of 12 March 2009 amending, for the purposes of its adaptation to technical progress, Council Directive 72/245/EEC relating to the radio interference (electromagnetic compatibility) of vehicles”

(12 March 2009)

## 3.2. PRIVATE DATA PROTECTION

### 3.2.1. [DATA RETENTION DIRECTIVE 2006/24/EC](#):

“Directive 2006/24/EC of the European Parliament and of the Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58 EC”

(15 March 2006)

### 3.2.2. [PRIVACY AND ELECTRONIC COMMUNICATIONS DIRECTIVE 2002/58/EC](#):

“Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector”

(12 July 2002)

### 3.2.3. [CORRIGENDUM: DIRECTIVE 2009/136/EC](#):

“Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users’ rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws”

(25 November 2009)

### 3.2.4. [CORRIGENDUM: DIRECTIVE 2009/140/EC](#):

“Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services”

(25 November 2009)

### 3.2.5. DATA PROTECTION DIRECTIVE 95/46/EC:

“Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data”

(24 October 1995)

### 3.2.6. REGULATION (EC) NO 45/2001:

“Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data”

(18 December 2000)

### 3.2.7. DECISION 2008/597/EC:

“Commission Decision of 3 June 2008 adopting implementing rules concerning the Data Protection Officer pursuant to Article 24(8) of Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data”

(3 June 2008)

### **3.3. RADIO APPLIANCES**

#### **3.3.1. ERC RECOMMENDATION:**

“ERC Recommendation 70-03 Relating to the Use of Short Range Devices (SRD)”

(7 February 2014)

#### **3.3.2. SAFETY:**

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013 - “Information technology equipment - Safety - Part 1: General requirements”

#### **3.3.3. RADIO EXPOSURE:**

Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)”

(12 July 1999)

EN 50364:2010 “Limitation of human exposure to electromagnetic fields from devices operating in the frequency range 0 Hz to 300 GHz, used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications”

EN 50385:2002 “Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz) - General public”

EN 62311:2008 “Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)”

#### **3.3.4. EMC:**

EN 301 489-3 v.1.6.1 (or 1.4.1 till 2015/05/31) “Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz”

EN 301 489-7 v.1.3.1 “Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)”

### 3.3.5. EFFECTIVELY USE OF RADIO SPECTRUM:

EN 300 330-2 v.1.5.1 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive”

EN 301 511 v.9.0.2 “Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)”

««««»»»»

To avoid redundancy, part of the DSRC technology standards are listed in paragraphs 3.4.3.1 and 3.4.4 (requirements stated by the standard, concerning the physical layer only, pertain this section).

### **3.4. EETS (FRONT-END)**

#### **3.4.1. RTTT APPLICATION PROFILES (general):**

EN 13372:2004 “Road Transport and Traffic Telematics (RTTT) - Dedicated short-range communication - Profiles for RTTT applications”

#### **3.4.2. DSRC APPLICATION INTERFACE:**

EN ISO 14906:2011 + Cor.1:2013 “Electronic fee collection - Application interface definition for dedicated short-range communication”

*Remark: EN ISO 14906:2011/FprA1 under approval.*

CEN ISO TS 14907-1:2010 + Cor.1:2010 “Electronic fee collection - Test procedures for user and fixed equipment - Part 1: Description of test procedures”

CEN ISO TS 14907-2:2011 “Electronic fee collection - Test procedures for user and fixed equipment - Part 2: Conformance test for the onboard unit application interface”

EN ISO 14816:2005 “Road Traffic and Transport Telematics (RTTT) – Automatic Vehicle and Equipment Identification – Numbering and Data Structures”

*Remark: EN ISO 14816:2005/prA1 under drafting.*

#### **3.4.3. DSRC INTEROPERABILITY APPLICATION PROFILE:**

EN 15509:2014 “Electronic fee collection - Interoperability application profile for DSRC” (IAP)

EN 15876-1:2010+A1:2012 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 1: Test suite structure and test purposes”

EN 15876-2:2011 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 2: Abstract test suite”

##### **3.4.3.1. Physical layer:**

EN 12253:2004 “Road Traffic and Transport Telematics - Dedicated short-range communication - Physical layer using microwave at 5,8 GHz”

ETSI EN 300 674-1 v.1.2.1:2004 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and

Medical (ISM) band; Part 1: General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU)”

ETSI EN 300 674-2-1 v.1.1.1: 2004 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive; Sub-part 1: Requirements for the Road Side Units (RSU)”

ETSI EN 300 674-2-2 v.1.1.1: 2004 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Road Transport and Traffic Telematics (RTTT);Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive; Sub-part 2: Requirements for the On-Board Units (OBU) “

#### *3.4.3.2. Data link layer:*

EN 12795:2003 “Road Traffic and Transport Telematics - Dedicated Short Range Communication (DSRC) - DSRC data link layer: medium access and logical link control”

ETSI TS 102 486-1-1 v.1.1.1: 2006 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification”

ETSI TS 102 486-1-2 v.1.2.1: 2008 “Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)”

ETSI TS 102 486-1-3 v.1.2.2: 2009 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Road Transport and Traffic Telematics (RTTT);Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma”



#### *3.4.3.3. Application layer:*

EN 12834:2003 “Road Traffic and Transport Telematics - Dedicated Short Range Communication (DSRC) - DSRC application layer”

ISO 15628:2013 “Intelligent transport systems - Dedicated short range communication (DSRC) - DSRC application layer”

ETSI TS 102 486-2-1 v.1.2.1: 2008 “Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification”

ETSI TS 102 486-2-2 v.1.2.1: 2008 “Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)”

ETSI TS 102 486-2-3 v.1.2.1: 2008 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma”

#### *3.4.4. ETSI DSRC (Italian toll charging system):*

ETSI ES 200 674-1 v.2.4.1: 2013 “Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communications (DSRC); Part 1: Technical characteristics and test methods for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band”

##### *3.4.4.1. Data link layer (TSS & TP):*

ETSI TS 102 708-1-1 v.1.1.1: 2010 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; part 1: Data Link Layer; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification”

ETSI TS 102 708-1-2 v.1.1.1:2010 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; Part 1: Data Link Layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)”

ETSI TS 102 708-1-3 v.1.1.1: 2010 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; Part 1: Data Link Layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma”

#### *3.4.4.2. Application layer (TSS & TP):*

ETSI TS 102 708-2-1 v.1.3.1:2013 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; Part 2: Application Layer; Sub-part 1: Protocol Implementation Conformance Statement (PICS) proforma specification”

ETSI TS 102 708-2-2 v.1.4.1:2013 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; Part 2: Application Layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)”

ETSI TS 102 708-2-3 v.1.4.1:2013 “Intelligent Transport Systems (ITS); RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band; Part 2: Application Layer; Sub-part 3: Abstract Test Suite (ATS) and partial PIXIT proforma”

#### *3.4.5. AUTONOMOUS SYSTEMS APPLICATION INTERFACE:*

CEN TS 16331:2012 “Electronic fee collection - Interoperable application profiles for autonomous systems” (IAP)

CEN ISO TS 17575-1:2010 + Cor.1:2013 “Electronic fee collection - Application interface definition for autonomous systems - Part 1: Charging”

CEN ISO TS 16407-1:2011 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-1 - Part 1: Test suite structure & test purposes”

CEN ISO TS 16407-2:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-1 - Part 2: Abstract test suite”

CEN ISO TS 17575-2:2010 “Electronic fee collection - Application interface definition for autonomous systems - Part 2: Communication and connection to the lower layers”

CEN ISO TS 16401-1:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-2 - Part 1: Test suite structure & test purposes”

CEN ISO TS 16401-2:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-2 - Part 2: Abstract test suite”

CEN ISO TS 17575-3:2011 + Cor.1:2013 “Electronic fee collection - Application interface definition for autonomous systems - Part 3: Context data”

CEN ISO TS 16410-1:2011 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-3 - Part 1: Test suite structure & test purposes”

CEN ISO TS 16410-2:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-3 - Part 2: Abstract test suite”

CEN ISO TS 17575-4:2011 “Electronic fee collection - Application interface definition for autonomous systems - Part 4: Roaming”

CEN ISO TS 16403-1:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-4 - Part 1: Test suite structure & test purposes”

CEN ISO TS 16403-2:2012 “Electronic fee collection - Evaluation of equipment for conformity to CEN ISO TS 17575-4 - Part 2: Abstract test suite”

CEN ISO TS 12813:2009 “Electronic fee collection - Compliance check communication for autonomous systems” (CCC)

*Remark: prEN ISO 12813 under approval.*

CEN ISO TS 13143-1:2011 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO TS 12813 - Part 1: Test suite structure and test purposes”

CEN ISO TS 13143-2:2011 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO TS 12813 - Part 2: Abstract test suite”

CEN ISO TS 13141:2010 + Cor.1:2013 “Electronic fee collection - Localisation augmentation communication for autonomous systems” (LAC)

*Remark: prEN ISO 13141 under approval.*

CEN ISO TS 13140-1:2011 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO TS 13141 - Part 1: Test suite structure and test purposes”

CEN ISO TS 13140-2:2012 “Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO TS 13141 - Part 2: Abstract test suite”

### **3.5. EETS (BACK-END)**

EN ISO 12855:2012 + Cor.1:2013 “Electronic fee collection. Information exchange between service provision and toll charging”

*Remark: prEN ISO 12855 under approval.*

### **3.6. SECURITY FRAMEWORK:**

CEN TS 16439:2013 “Electronic fee collection - Security framework”

*Remark: upcoming CEN ISO TS 19299, under approval*

### **3.7. OTHER STANDARDS TO CONSIDER:**

ISO IEC 15408-1:2009 “Information technology - Security techniques - Evaluation criteria for IT security - Part 1: Introduction and general model”

ISO IEC 15408-2:2008 “Information technology - Security techniques - Evaluation criteria for IT security - Part 2: Security functional requirements”

ISO IEC 15408-3:2008 “Information technology - Security techniques - Evaluation criteria for IT security - Part 3: Security assurance requirements”

CEN ISO TS 17444-1:2012 “Electronic fee collection - Charging performance - Part 1: Metrics”

CEN ISO TS 17444-2:2013 “Electronic fee collection - Charging performance - Part 2: Examination framework”

ISO 17573:2010 “EFC system architecture for vehicle related transport services”

CEN ISO TS 17574:2009 “EFC security services framework - guidelines for security protection profiles”

CEN ISO TS 25110:2013 “Electronic fee collection - Interface definition for on-board account using integrated circuit card” (ICC)

CEN TR 16040:2010 “Electronic fee collection - Requirements for urban DSRC systems”

CEN TR 16092:2011 “Electronic fee collection - Requirements for pre-payment systems”

CEN TR 16152:2011 “Electronic fee collection - Personalisation and mounting of first mount OBE”

CEN TR 16219:2011 “Electronic fee collection - Value added services based on EFC on-board equipment”

## 4. INTEROPERABILITY CONSTITUENTS

Documents detailed in the previous chapter are gathered per single interoperability component. They are classified as "C" if compulsory, "R" if recommended or "V" if voluntary, depending on their applicability scope.

### 4.1. ROAD SIDE EQUIPMENT (RSE):

#### 4.1.1. ETSI DSRC (Italian toll charging system):

	CE	EETS	Other
R&TTE	C		
EMC	(1)		
LVD	(1)		
RoHS	C		
ERC RAC 70-03	C		
(1) applicable, though in the R&TTE scope			
EN 60950-1	C		
EN 50385	C		
EN 301 489-3	C		
EN 15509		R	
ETSI ES 200 674-1	C	C	
ETSI TS 102 708-1-1		C	
ETSI TS 102 708-1-2		C	
ETSI TS 102 708-1-3		C	
ETSI TS 102 708-2-1		C	
ETSI TS 102 708-2-2		C	
ETSI TS 102 708-2-3		C	
CEN TS 16439			C
Toll context parameters		C	
EN 60068-2-x			V

Table 4.1.1

#### 4.1.2. CEN DSRC:

*[under study]*

#### 4.2. ON BOARD UNITS (OBU):

*[under study]*

#### 4.3. BACK OFFICE SYSTEMS:

*[under study]*