
**Intelligent transport systems —
Lower layer protocols for usage in the
European digital tachograph**

*Systèmes de transport intelligents - Protocoles de couche basse pour
utilisation dans le cadre du chrono tachygraphe numérique européen*



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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is designed to encompass communication requirements in support of the Smart Digital Tachograph (SDT) as identified by Regulation 2016/799 of the European Union^[23].

This document specifies SDT Communications (SDTC). SDTC is the application of CEN Dedicated Short Range Communication (DSRC) for SDT. See the following:

- EN 12253, *Road transport and traffic telematics — Dedicated short-range communication — Physical layer using microwave at 5,8 GHz*^[1]
- EN 12795, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC data link layer: medium access and logical link control*^[2]
- EN 12834, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*^[3]
- EN 13372, *Road transport and traffic telematics — Dedicated short-range communication — Profiles for RTTT applications*^[4]

Complementing the standardized specifications and descriptions, several private documents describe this dedicated short range semi-passive communication technology in an informative manner, providing additional detailed explanations and implementation hints. See for example:

- DSRC tutorial published by ESF GmbH in July 2003 (publicly available)^[24];
- GSS industry specification published in August 2003^[25] (no longer available from the authors; essential content is now available in ISO 15509);

It is to be noted that the abovementioned private documents provide information that can be essential to easily achieving interoperability with existing DSRC equipment and optimum performance.

EN 12253^[1] deals with the physical layer of the DSRC protocol stack presented in [Figure 1](#); i.e. it comprises requirements for Open Systems Interconnection (OSI) Layer 1 at 5,8 GHz for DSRC.

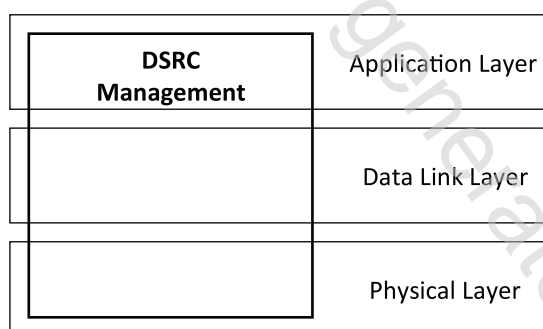


Figure 1 — DSRC protocol stack

EN 12253^[1] does not include associated measurement procedures for verification of the requirements. Test methods for conformity are provided in ETSI EN 300674-1^[12], ETSI EN 300674-2-1^[13] and ETSI EN 300674-2-2^[14].

EN 12253^[1] caters for on-board units based on transponder technologies. Furthermore, it allows for mixed time, frequency and space division multiple access approaches.

EN 12253^[1] is conceived for the 10 MHz part (i.e. 5,795 GHz to 5,805 GHz) of the ISM band at 5,8 GHz which is recommended by ECC/DEC(01)01^[10]. An additional sub-band (5,805 GHz - 5,815 GHz) may be

allocated on a national basis. National restrictions on the usage of these frequency bands can apply according to CEPT/ERC REC 70-03^[11].

EN 12795^[2] gives the architecture and services offered by the DSRC data link layer.

EN 12834^[3] and the almost identical ISO 15628 give the architecture and services offered by the DSRC application layer.

EN 13372^[4] deals with the interlayer management of the DSRC protocol stack.

Figure 2 illustrates the global data flow between the elements of the SDTC stack, (physical layer, data link layer and application layer) and the SDT application.

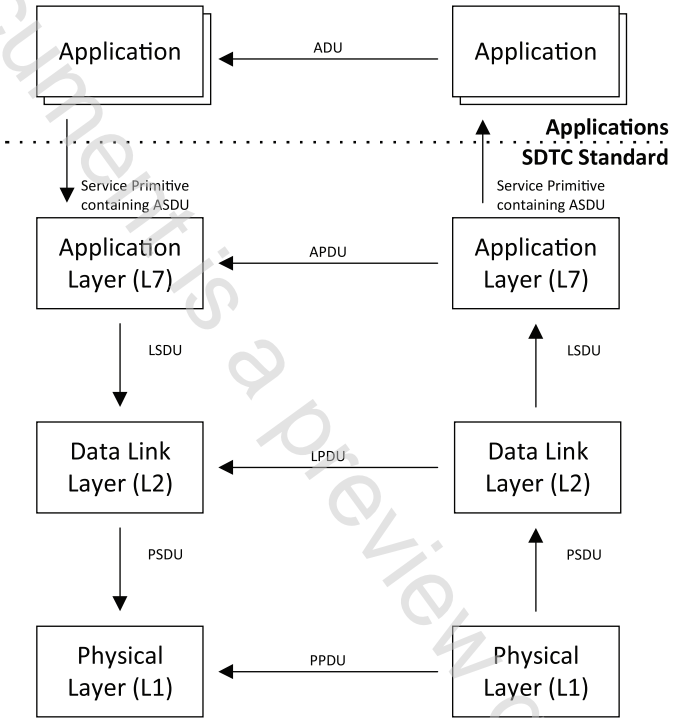


Figure 2 — Architecture and data flow of the SDTC stack

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1 Scope

This document specifies communication requirements in support of the Smart Digital Tachograph (SDT) as identified by Regulation 2016/799 of the European Union^[23].

The specification covers:

- the physical layer at 5,8 GHz for SDT communications (SDTC);
- the data link layer (DLL) of SDTC;
- the application layer of SDTC;
- SDTC profiles which provide coherent sets of communication tools for applications based on SDTC.

This document provides further information beneficial for the design and development of SDTC equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15628, *Intelligent transport systems — Dedicated short range communication (DSRC) — DSRC application layer*

ISO/IEC 13239, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

adjacent channel

neighbouring SDTC channel for use by two or more emissions

Note 1 to entry: It is possible that a SDTC channel has either one of two adjacent channels.

3.2

antenna bore sight direction

direction of maximum antenna gain