

English version

**Identification card systems - Surface transport applications -
Electronic fee collection - Part 1: Physical characteristics,
electronic signals and transmission protocols**

This European Prestandard (ENV) was approved by CEN on 10 May 2001 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions.....	6
4 Abbreviations	6
5 EFC using DSRC	7
5.1 Physical characteristics	7
5.1.1 General.....	7
5.1.2 Temperature	7
5.1.3 Embossing.....	8
5.1.4 Provision of contacts.....	8
5.1.5 Insertion-removal endurance.....	8
5.1.6 Toxicity.....	8
5.2 Electronic signals and electrical characteristics under normal operating conditions.....	8
5.2.1 VCC.....	8
5.2.2 CLK.....	8
5.2.3 VPP.....	8
5.3 Transmission protocols	9
5.3.1 General.....	9
5.3.2 Answer-To-Reset.....	9
5.3.3 Transmission bit rate.....	9
5.3.4 Protocol switching.....	9
5.3.5 Protocol Type T = 1	10
5.3.6 Protocol Type T = 0.....	11
5.3.7 Error handling protocols.....	12
6 EFC using GSM	12
Bibliography	13

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 224, "Machine readable cards, related device interfaces and operations" the secretariat of which is held by AFNOR.

This European Prestandard comprises the following parts, under the general title "Identification card systems – Surface transport applications – Electronic fee collection":

- *Part 1 : Physical characteristics, electronic signals and transmission protocols*
- *Part 2 : Message requirements*
- *Part 3 : Application and security aspects*
- *Part 4 : Test procedures*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Prestandard is one of a series of Standards describing the characteristics of IC cards used in Electronic Fee Collection (EFC) systems based on :

- the Dedicated Short Range Communication (DSRC) ; and
- the Global System for Mobile Communication (GSM) ;

and the characteristics of the interface between those IC cards and the related card interface devices installed in vehicles, so-called On-Board-Units.

1 Scope

This European Prestandard specifies directly or by reference the physical characteristics, electronic signals and transmission protocols for integrated circuit(s) cards (ICCs) carrying the EFC application and related requirements for On-Board-Units (OBUs) used in Electronic Fee Collection systems based on Dedicated Short Range Communication and Global System for Mobile Communication, with the target to provide basic interoperability between an ICC and an OBU independently of the respective manufacturers and operators. It takes into consideration both environmental and system related aspects and states minimum requirements of conformity.

The requirements imposed by this Prestandard apply to :

- the IC card itself, denoted by the abbreviation ICC ;
- the in-vehicle card interface device, denoted by the abbreviation OBU ; or
- the combination of both.

This Prestandard does not directly set requirements on any other card interface device (IFD) besides the OBU e.g. stationary devices. However, the requirements imposed on the IC card may induce technical consequences for an IFD designed to accept an IC card used in EFC applications.

It specifies the respective characteristics of the ICC and OBU only as far as these may concern the interface, but does not give any internal technical implementation.

2 Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 726-3:1994, *Identification card systems – Telecommunications integrated circuit(s) cards and terminals – Part 3 : Application independent card requirements.*

ENV 1375-1:1994, *Identification card systems – Intersector integrated circuit(s) card additional formats – Part 1 : ID-000 card size and physical characteristics.*

ENV 1855:1996, *Identification card systems – Intersector integrated circuit(s) card systems – Tolerance ranges for IC cards.*

ETS 300 641, *European digital cellular telecommunications system (Phase 2) ; Specification of the 3 Volt Subscriber Identity Module – Mobile Equipment (SIM – ME) interface (GSM 11.12 V 4.2.0).*

ETS 300 699, *European digital cellular telecommunications system (Phase 2+) – Specification of the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface (GSM 11.11 V 5.5.0).*

ISO/IEC 7810:1995, *Identification cards — Physical characteristics.*

ISO/IEC 7811-1:1995, *Identification cards — Recording technique — Part 1 : Embossing.*

ISO/IEC 7811-3:1995, *Identification cards — Recording technique — Part 3 : Location of embossed characters on ID-1 cards.*

ISO/IEC 7812-1: 1993, *Identification cards — Identification of Issuers — Numbering system.*

ISO/IEC 7816-1:1998, *Identification cards — Integrated circuit(s) cards with contacts — Part 1 : Physical characteristics.*

ISO/IEC 7816-2:1999, *Identification cards — Integrated circuit(s) cards with contacts — Part 2 : Dimensions and location of the contacts.*