

---

---

**Road transport and traffic telematics —  
Electronic fee collection (EFC) —  
Interface specification for clearing  
between operators**

*Télématique de la circulation et du transport routier — Perception  
du télépéage — Spécification des interfaces pour la compensation  
des recettes entre opérateurs*

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

© ISO 2002

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

## 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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 14904 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 204, *Transport information and control systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European pre-Standard..." to mean "...this Technical Specification...".

This first edition of ISO/TS 14904 cancels and replaces ISO/TR 14904:1997, which has been technically revised.

## Contents

	page
Foreword.....	v
Introduction.....	vi
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Basic interfaces for clearing between operators .....	4
5 Interface framework .....	4
6 Method of description .....	10
7 Message.....	11
Annex A (informative) Conceptual Model .....	13
Annex B (informative) Relation between Conceptual and Organisational Models.....	15
Annex C (informative) Message frame format .....	19
Annex D (informative) Protocol Data Unit.....	23
Annex E (informative) Payment Objects based on data elements defined in ISO 8583 .....	30
Bibliography .....	31

ITIH STANDARD PREVIEW  
(standards.iteh.ai)

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

## Foreword

The text of ENV ISO 14904:2002 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 Prestandard supersedes ENV ISO 14094:1997.

In this European Prestandard, the annexes A to F are informative.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

## Introduction

Integration of payment systems concerns the co-ordination and handling of all payment services for traffic and transport applications. This co-ordination involves:

- a) the use of a common payment concept for services within or related to road traffic and transport;
- b) the enabling of exchange of payment transactions and operational information between different operators involved in public and private transport services; and
- c) the method of payment itself, i.e. the access to electronic payment means, for the settlement of these acquired services.

In order to enable the integration of payment systems on a higher (e.g. pan-European) level and make clearing between operators possible, the interfaces involved need to be standardised.

Therefore this European Prestandard / ISO Technical Standard is designed as an interface specification enabling data to be exchanged between different operators and systems adopting a variety of application specifications.

It should be noted that although the data structures defined in the current version of the European Prestandard / ISO Technical Standard reflect a focus on information transfers for clearing purposes, the interface specification defined herein supports equally well other types of information transfers required within and between payment systems.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

## 1 Scope

This European Prestandard specifies the interfaces for clearing between operators and gives a framework of the common message structure and data elements to be used on the interfaces. Its objective is to make the transfer of payment and Electronic Fee Collection (EFC) related data possible both between different payment systems and between different operators such as collection agents, clearing operators, or providers of public and private transport services.

This European Prestandard supports:

- a) different payment modes (e.g. pre-payment, post-payment);
- b) a wide variety of transport and transport related services (tolling, parking, ferry/bridge/tunnel, public transport, payment for route guidance etc.);
- c) operator services (co-ordination between collectors of money and charge points etc.);
- d) security and privacy.

It is not within the scope of this European Prestandard to define administrative procedures and organisational structures. The specification of a higher (e.g. pan-European) level inter-operable payment system is outside the scope of this European Prestandard.

Not described within this European Prestandard are indirect (external) participants such as authorities, enacting general or special legislation concerning the payment system and other national regulations.

The models presented in this standard are generic. Simple systems (closed systems) can be designed by selecting subsets of the interface framework described herein.

## 2 Normative references

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-014ac82897b2/iso-ts-14904-2002)

[https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-014ac82897b2/iso-ts-14904-2002)

[014ac82897b2/iso-ts-14904-2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-014ac82897b2/iso-ts-14904-2002)

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).

ISO/IEC 7812 (all parts), *Identification cards — Identification of issuers*

ISO/IEC 7816-5, *Identification cards — Integrated circuit(s) cards with contacts — Part 5: Numbering system and registration procedure for application identifiers*

ISO 8583, *Financial transaction card originated messages — Interchange message specifications*

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

ISO 9594 (all parts), *Information technology — Open Systems Interconnection — The Directory*

ISO 11770-1, *Information technology — Security techniques — Key management — Part 1: Framework*

ENV ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ENV ISO 14906, *Road Transport and Traffic Telematics (RTTT) — Electronic Fee Collection (EFC) — Application interface definition for dedicated short range communications*

ENV 1545-1, *Identification card systems — Surface transport applications — Part 1: General data elements*

### 3 Terms and definitions

For the purpose of this European Prestandard, the following terms and definitions apply.

#### 3.1

##### **Apportionment**

allocation of money to transport service operators according to the consumption of the services provided, e.g. a bus operator being paid an amount based on the number of a particular type of customer carried

#### 3.2

##### **Chained Services**

combination of services that result in a discount and/or access rights in one or more of the consumed services. The discount or access rights are usually given to the *User* as a result of having consumed a previous service

#### 3.3

##### **Clearing**

operation of re-allocating value generated in the payment system(s) between the various operators in a payment system or between payment systems. This operation reflects commercial agreements existing between those parties. An example of such an operation is the exchange of information between *Service Providers* and an *Issuer* which enables the transfer of money from the *Issuer*, collecting the money from the *User*, to the *Service Provider*

#### 3.4

##### **Clearing Operator**

entity that collects and possibly aggregates transactions from one or more *Service Providers* for delivery to the *Issuer(s)*. The *Clearing Operator* can also handle the *Apportionment* between the *Service Providers*. In the financial world this operator is equivalent to an Acquirer

iTeh STANDARD PREVIEW

(standards.iteh.ai)

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

#### 3.5

##### **Collection Agent**

entity responsible for selling, reloading or delivering the *Payment Means* to the *User* and collecting the payment from the *User*. The *Collection Agent* can also collect user related application specific data from the *User*

#### 3.6

##### **Contract**

expression of an agreement between two or more parties in a payment system or between payment systems. An example of a contract is the specific relationship between a *User* and an *Operator* in a payment system. The contract in this case defines the conditions under which the user may use the services and the amount to be charged

#### 3.7

##### **(Intersector) Electronic Purse**

application in an Integrated Circuit Card which stores and manipulates electronic value in a secure way and which replaces cash for payments by the *User*

#### 3.8

##### **Electronic Fee Collection**

collection of a fee for a transport service where the fee is collected via the exchange of data, e.g. via an air-link communication, enabling the user to pay for the service with electronic values, e.g. an electronic purse or values stored in a central account

#### 3.9

##### **Enforcement Operator**

entity responsible for prosecution on the basis of violation information provided by the *Service Providers*.



**3.10****Integrated Payment Systems**

common framework of payment methods and information exchange between operators or payment systems that makes transfer of money from one payment system or operator to another possible (*Clearing/Apportionment*)

**3.11****Issuer**

entity responsible for the payment system and responsible for issuing the *Payment Means* to the *User*

**3.12****Operator**

generic term for the entities Issuer, Clearing Operator, Collection Agent, Service Provider, Enforcement Operator or Trusted Third Party

**3.13****Payment Means**

expression of a *Contract* between the *User* and the *Issuer* (or via a *Collection Agent*) that allows the *User* to access the services available in the *Payment System*, e.g. an account in a credit card system or an *Electronic Purse*

**3.14****Payment Method**

combination of a *Payment Means*, a *Payment Mode* and a *Payment Scope*

**3.15****Payment Mode**

parameter defining the time dimension in payment by the *User*, e.g. Pre-payment or Post-payment

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

**3.16****Payment Scope**

application extent of the *Payment Method*, e.g. national transport or inter-sector

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

**3.17****Payment System**

financial system that includes the complete process of *Issuing*, use of *Payment Means*, *Clearing* and *Settlement* of transactions

**3.18****Service Provider**

person, company, authority or abstract entity offering a service to the *User* for which the user has to pay a fee (the fee can in some cases be zero, e.g. emergency vehicles)

**3.19****Settlement**

transfer of funds from one *Operator* to another according to the *Clearing* rules

**3.20****Trusted Third Party**

entity who might be responsible for operation monitoring, system and security assessment (including security key management) as well as granting licences

3.21

User

entity that uses services provided by the *Service Provider* according to the terms of the *Contract* expressed by the *Payment Means*. The *User* receives and reloads the electronic *Payment Means* through the *Collection Agent*

4 Basic interfaces for clearing between operators

This European Prestandard identifies the following basic interfaces required for clearing between operators within a payment system and between payment systems (see annex A Conceptual Model for further explanations):

Table 1 – Overview of operator interfaces

Operators interfaced	Interfaces covered by the standard	Interfaces NOT covered by the standard
Any Operator to any Operator (see definition of Operator in 3)	X	-
User - Service Provider	-	X
Collection Agent – User	-	X

NOTE The interface specification defined in this European Prestandard is designed to be flexible enough to accommodate any additional operator-to-operator information transfer paths which can be required by the integration and operation of payment systems.

ITEH STANDARD PREVIEW  
(standards.iteh.ai)

5 Interface framework

ISO/TS 14904:2002

<https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002>

5.1 Introduction

Clause 5 defines a common message structure to enable the exchange of data on any of the interfaces between operators.

The common message structure is summarised in 5.2 and described in more detail in annex C.

NOTE Message class, message type, sender ID, receiver ID and message ID are only normative requirements when they are not provided by other communication layers.

5.2 Summary of message structure

The message structure shall be transferred either explicitly defined in this standard or implicitly using services defined by other communication protocols.

EXAMPLE TCP/IP, XML/EDIFACT can be used to transfer messages.

Figure 1 shows graphically an example of the message structure for the Electronic fee Collection (EFC) related Protocol Data Unit (PDU). The objects shown in the diagram (the information forming the Message Body) can either be unsecured or secured globally or individually.

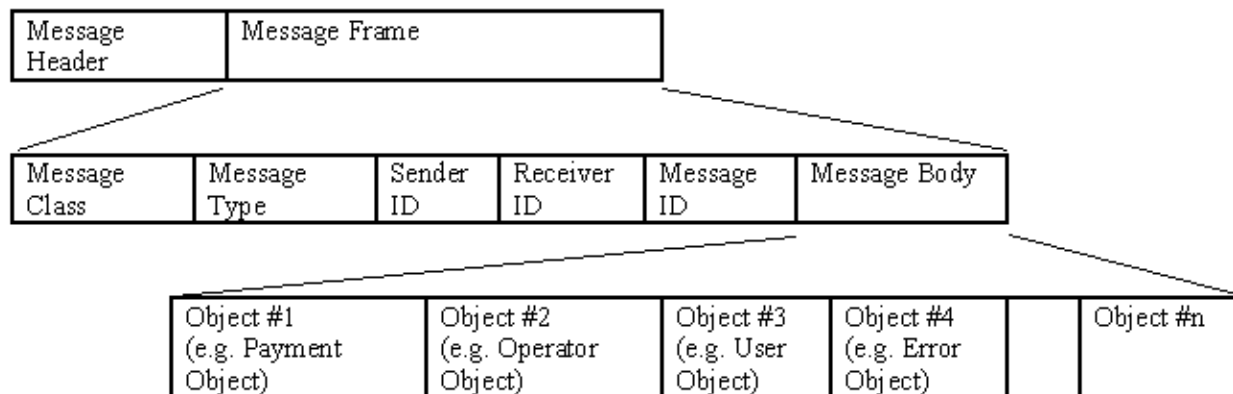


Figure 1 - Example of the message structure

### 5.3 Message header

At the beginning of each message is a message header. The message header contains a version identifier.

The version identifier is an integer that identifies the version of the protocol. As this integer is always the first element in the sequence, the receiving party is always able to identify the version of the protocol being used to send the data. This European Prestandard defines version 2 of the protocol.

NOTE ENV ISO 14904:1997 defines version 1 of the protocol.

[ISO/TS 14904:2002](https://standards.iteh.ai/catalog/standards/sist/394b5c83-9dc6-4fb1-95b1-0d4ac82897b2/iso-ts-14904-2002)

### 5.4 Message frame

The message frame may be included in the message structure defined in 5.2. Annex C shows how the message frame can be formatted.

### 5.5 Security data

The main objective of Data Protection in EFC systems is to protect the interests of those relying on the EFC systems, from any harm or damage caused by lack of availability, confidentiality, integrity, non-repudiation and privacy of personal data.

Part of the information exchanged over the interfaces is covered by this European Prestandard, constituting an important asset for the respective parties involved. Whilst meeting the security needs of a closed system remains the domain of the parties concerned, an interface specification constitutes a common ground for the implementation of real-world interfaces for clearing between operators within the scope of a higher (e.g. pan-European) level integrated payment system. The interface specification should make sufficient provision to incorporate current and future security related items.

The security data at the message level and the secured data objects provide support for security related items. The various security issues can be stated as follows:

**Confidentiality** Sensitive data and information are available only to authorised parties (confidentiality of contents);

In addition to pure financial transaction information which may naturally be subject to tampering, other, more transport related types of information are to be carried through the same interface (i.e. volumes, type of operations, details

of activities, network etc.). This information can prove very sensitive in an increasingly competitive environment;

Integrity	Sensitive data, information and message sequencing are guarded in such a way that any alteration or destruction by unauthorised parties is detected (integrity of contents, integrity of message sequence);
Authentication	The origin and destination of information and the entities involved in the exchange of information are authenticated (message origin authentication, message destination authentication, peer entity authentication);
Non-repudiation	Protection against the denial, by one of the parties involved in the communication through the interface, of having participated in all or part of the communications. Support for the following forms of non-repudiation services may be required: <ul style="list-style-type: none"><li>- Non-repudiation with proof of origin;</li><li>- Non-repudiation with proof of delivery;</li><li>- Non-repudiation with proof of submission;</li></ul>
Availability	Data, information are available to authorised parties;
Auditing/Accountability	Protection against anomalies in the flow of transactions by the use of time variant parameters. This may also include recording of system activity for security related monitoring purposes.

PREVIEW  
(standards.iteh.ai)

## 5.6 Security and Privacy

ISO/TS 14904:2002

As EFC systems need to address both data security and privacy issues, defined in the following as a combined domain called Data Protection, their architecture needs also to provide the adequate support. In EFC system architectures, and for the purposes of this standard, privacy is taken as being related to the rights of individual users of the system in respect with the way their personal data is stored and handled within the EFC system and possibly across EFC systems, e.g. clearing between operators.

## 5.7 Data Protection Framework

The model shown in Figure 2 provides a general framework for interpreting the primary relationships between the main issues and elements involved in the planning design and operation of data protection schemes: