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

*Transport routier et télématique du trafic — Prélèvement automatique de
frais (AFC) — Spécification d'interface pour clarification entre opérateurs*

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Foreword

ISO (the International Organisation 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 or 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 main task of technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 14904, which is a Technical Report of type 2, was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee ISO/TC 204, *Transport information and control systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

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This document is being issued in the Technical Report (type 2) series of publications (according to subclause G.3.2.2 of part 1 of the ISO/IEC Directives, 1995) as a “prospective standard for provisional application” in the field of *transport information and control systems* because there is an urgent need for guidance on how standards in this field should be used to meet an identified need.

This document is not to be regarded as an “International Standard”. It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the ISO/TC 204 Secretariat.

A review of this Technical Report (type 2) will be carried out not later than three years after its publication with the options of: extension for another three years; conversion into a International Standard; or withdrawal.

Annexes A and ZA form an integral part of this Technical Report. Annexes B to E are for information only.

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1. Foreword

The text of ENV ISO 14904:1997 has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, the secretariat of which is held by NNI, in collaboration with Technical Committee ISO/TC 204 “Transport information and control systems”.

This Prestandard is prepared under the authority of CEN/TC 278 “Road transport and traffic telematics” by a project team (PT1) set up by CEN/TC 278 and consisting of a group of experts from the financial and transport sectors.

The Prestandard references standards made by other project teams and working groups under CEN/TC 224, ISO/TC 204 as well as existing standards made by ISO.

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

NOTE: Normative references to International Standards are listed in annex ZA (normative).

2. 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.

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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 Prestandard 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 Prestandard 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.

All amendments and additions to this Prestandard will be handled by CEN TC 278/WG1 through the use of a database of data objects maintained by the workgroup.

3. Scope

This Prestandard defines 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 Automatic Fee Collection (AFC) 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 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 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 Prestandard.

Not described within this 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.

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4. Normative references

This Prestandard incorporates by dated or undated reference, provisions from other publications and standards. 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 or standards apply to this Prestandard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

ISO 7812-1	Identification cards - Identification of issuer - Part 1: Numbering scheme
ISO 7812-2	Identification cards - Identification of issuer - Part 2: Application and registration procedures
ISO 7816-5	Identification cards - Integrated circuit cards with contacts - Registration system for applications in IC cards
ISO 8824	Information processing systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1)
ISO 8825	Information processing systems - Open Systems Interconnection - Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)
ISO 8583	Financial transaction card originated message - Interchange message specifications
ISO 9735	Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) - Application level syntax rules (amended and reprinted)
ISO 9594	Information technology - The Directory

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5. Definitions

For the purpose of this Prestandard the following definitions apply:

5.1. Apportionment

The 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.

5.2. Chained Services

A 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.

5.3. Clearing

The 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*.

5.4. Clearing Operator

The 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.

5.5. Collection agent

The 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*.

5.6. Contract

This is the 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.

5.7. (Intersector) Electronic Purse

An 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*.

5.8. Integrated Payment Systems

A 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*).

5.9. Issuer

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

5.10. Operator

Generic term for the entities Issuer, Clearing Operator, Collection Agent and Service Provider.

5.11. Payment Means

The 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*.

5.12. Payment Method

A combination of a Payment Means, a Payment Mode and a Payment Scope.

5.13. Payment Mode

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

5.14. Payment Scope

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

5.15. Payment System

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

5.16. Service Provider

The entity that accepts the *User's* payment means and in return provides the service to the *User*. Automatic fee collection information created at the point of service consumption is collected by the *Service Provider*.

5.17. Settlement

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

5.18. User

The 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*.

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6. Basic interfaces for clearing between operators

This Prestandard identifies the following minimum set of basic interfaces required for clearing between operators within a payment system and between payment systems:

Operators interfaced	Interfaces covered by the standard	Interfaces NOT covered by the standard
User - Service Provider		X
Service Provider - Clearing Operator	X	
Clearing Operator - Issuer	X	
Issuer - Collection Agent	X	
Collection Agent - User		X
Clearing Operator - Clearing Operator	X	

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

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7. Interface framework

7.1. Introduction

This section defines a common message structure to enable the exchange of data on any of the 4 interfaces specified in section 6.

The common message structure is summarised in section 7.2 and described in more detail in the subclauses hereafter.

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

7.2. Summary of message structure

Figure 7.1 shows graphically the message structure for the Automatic Fee Collection (AFC) related Protocol Data Unit (PDU). The objects shown in the diagram can either be unsecured or secured globally or individually.

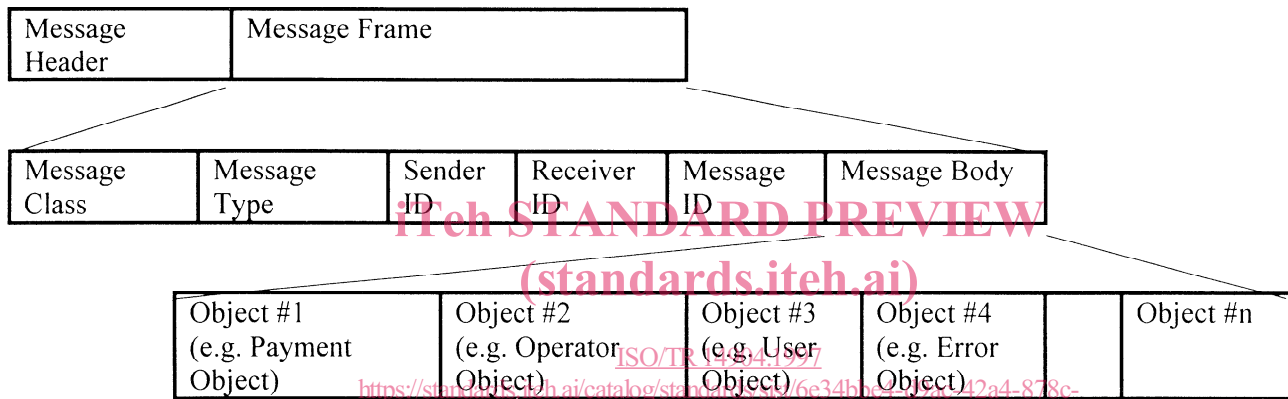


Figure 7.1: Message Structure

7.3. 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 will always be the first element in the sequence, the receiving party will always be able to identify the version of the protocol being used to send the data. This Prestandard defines version 1 of the protocol.

7.4. Message frame

This part of the message contains the core data called Protocol Data Unit (PDU). Within the description of the message frame there is a choice between a number of different protocol data units. These PDU's can be of the following type:

- AFC related PDU (as described in this Prestandard)
- any other PDU that is defined externally.

NOTE: External PDUs can include: ISO8583 PDU, CEN/TC224 PDU, EDIFACT PDU etc.

The Message Frame for the AFC related PDU contains the following elements:

- a) Message Class
- b) Message Type
- c) Sender ID
- d) Receiver ID
- e) Message ID
- f) Message Body

These elements are described further in the following subclauses.

7.4.1. Message class

The Message Class defines the purpose of a message. All messages belong to one of six different message classes. The different Message Classes defined in this Prestandard are :

- a) Request
- b) Request Response
- c) Advice
- d) Advice Response
- e) Notification
- f) Notification Acknowledgement

7.4.1.1. Request

A Request is a class of message in which the sender requests some action and/or some information from the receiver. The request could for example be a request for a transaction approval or a request for reconciliation totals.

7.4.1.2. Request Response

A Request Response is a class of message that is sent in response to a request message. The response should be sent when the requested action is performed and/or when the requested information is available. The response contains the result of the action or the requested information.

7.4.1.3. Advice

An Advice is a class of message that contains information that is vital for the proper function of the system. This could be, e.g. a status list or key management data.

7.4.1.4. Advice Response

An Advice Response is a class of message that is sent in response to an advice message. The response does not carry any requested data, but is merely a reply that indicates whether the advice was or is going to be followed or not.

7.4.1.5. Notification

A Notification is a class of message in which the sender informs the receiver of some action the sender or some other party has performed. This could for example be information about a report that has been sent to the authorities.

7.4.1.6. Notification Acknowledgement

A Notification Acknowledgement is a class of message that can be sent in response to a notification message.

7.4.2. Message type

The Message Type is the basic selection between different types of messages.