
**Intelligent transport systems — Automatic
vehicle and equipment identification —
Numbering and data structures**

*Systèmes intelligents de transport — Identification automatique des
véhicules et des équipements — Numérotation et structures des données*

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Published in Switzerland

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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.

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.

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 17262 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with Technical Committee CEN/TC 278, *Road transport and traffic telematics*.

This first edition of ISO 17262 cancels and replaces the first edition of ISO/TS 17262:2003, which has been technically revised.

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Introduction

Within the context of Intelligent transport systems (ITS) (previously known as RTTT/TICS), intermodal goods transport AVI/AEI systems have the specific objective of achieving a unique or unambiguous positive identification of equipment, and to make that identification automatically. This International Standard defines data to achieve this particular objective.

This International Standard specifies data that enable future upward integration and expansion for intermodal goods transport AVI/AEI systems. The standard is thus designed to be flexible and enabling rather than prescriptive.

For the definition of data, "Abstract Syntax Notation One" (ASN.1) is applied. This usage provides maximum interoperability and conformance to existing Standards within the ITS sector.

Annex C can be consulted prior to the main body of this International Standard for an overview of ASN.1. ISO/IEC 8824, ISO/IEC 8825 and other publications on ASN.1 can also be consulted for further information.

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Intelligent transport systems — Automatic vehicle and equipment identification — Numbering and data structures

1 Scope

This International Standard defines generic numbering and data structures for unambiguous identification of equipment used for Intermodal goods transport. These data are known as “Intermodal Goods Transport Numbering and Data Structures”.

This International Standard defines data independently of the data carrier. The modelling of data is based on Abstract Syntax Notation One (ASN.1) as defined in ISO/IEC 8824. This International Standard excludes any physical aspects such as interfaces, dimensions etc. Data that form part of transmission or storage protocols (headers, frame markers and checksums) are excluded.

Data defined in this International Standard require a system for control and distribution of number series independent of the different AVI/AEI systems. This is required in order to avoid ambiguity and to provide the necessary level of security where appropriate. For this reason the registration authority defined in ISO 14816 applies for this International Standard.

This International Standard enables the use of optimised encoding schemes such as ASN.1 Packed Encoding Rules (PER).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13044, *Swap bodies — Coding, identification and marking*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 8824-2, *Information technology — Abstract Syntax Notation One (ASN.1): Information object specification*

ISO/IEC 8824-3, *Information technology — Abstract Syntax Notation One (ASN.1): Constraint specification*

ISO/IEC 8824-4, *Information technology — Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications*

ISO 14816:2005, *Road traffic and transport telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 17621, *Intelligent transport systems — Automatic vehicle and equipment identification — Intermodal goods transport architecture and terminology*

ISO 26683-2, *Intelligent transport systems — Freight land conveyance content identification and communication — Part 2: Application interface profiles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17621 and the following apply.

- 3.1
AEI manager**
component, which receives data from 'AEI Readers' and compares it with information in a data base at which point an ok or error message is generated and transferred to the message display component
- 3.2
reader**
complete set of equipment even if it consists of more than one components required to interrogate, receive and interpret the data in the TAG in order to present the identification
- 3.3
AEI system**
AEI application in a RTTT/TICS system either as a stand-alone system or as part of a RTTT/TICS application
- 3.4
component**
type, class or any other work-product that has been specifically engineered to be reusable
- EXAMPLE TAG, reader, AEI manager
- 3.5
conveyance**
means of transport
- 3.6
intermodal transport**
movement of goods in one and the same loading unit or vehicle that uses successively several modes of transport without handling of the goods themselves when changing modes
- 3.7
load unit**
cargo transportation unit, which may be loaded on a transport means
- NOTE Synonyms: package, container.
- 3.8
message display**
receives data from AEI manager, and display the data on a variable message sign to the driver
- 3.9
terminal monitoring point
terminal access control point**
point administered by the AEI manager where the monitoring of transport objects is performed
- 3.10
transport object**
transport means, load unit or goods item

4 Symbols and abbreviated terms

AEI	Automatic Equipment Identification
ASN.1	Abstract Syntax Notation number One
DSRC	Dedicated Short Range Communication
ITS	Intelligent Transport System(s)
RTTT	Road Transport and Traffic Telematics (CEN/TC 278)
NOTE	Legacy European name for ITS

TICS Transport Information and Control Systems (ISO/TC 204)
 NOTE now known as ITS

5 Components of AVI/AEI for intermodal goods transport

5.1 Context

This International Standard provides interoperability, not only between simple AVI/AEI and more complex ITS/RTTT functions, but also with pre-existing standards such as container (ISO 10374). Specifications for protecting against changes, classifying and qualifying security aspects of the data are out of scope of this International Standard.

This International Standard relates to AVI/AEI units, but not to smaller containers and units being transported. For smaller units (pallet loads, trays, parcels etc.) please refer to ISO 26683 and JTC 1/SC31 standards, ISO 18000 series, etc.. However, CS10 defined herein, provides a means to provide land conveyance content data using such standards. The numbering structure defined in this International Standard is designed to enable combinations with the data definitions from ISO 18000 series. This combination is covered in ISO 17264.

This International Standard provides the capability to carry application data, associated with the identification, to be carried as part of the AVI/AEI message. Within this International Standard this is provided as a “black box” facility. The definition of the structure and contents of such messages are outside the scope of this International Standard (examples are shown in ISO 17264).

5.2 General

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The components, which are involved in the AVI/AEI intermodal goods transport are the:

AEI manager; [ISO 17262:2012](https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e55111e77/iso-17262-2012)
 reader; <https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e55111e77/iso-17262-2012>
 message display;
 transport object/TAG.

The overview of components are illustrated in Figure 1:

Class Diagram

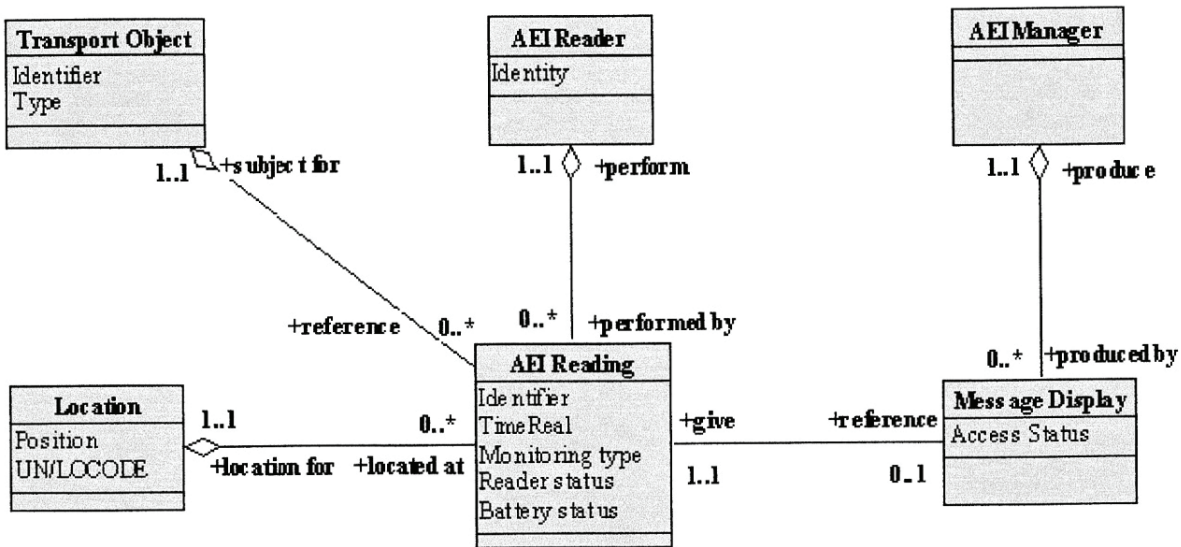


Figure 1 — Components of AVI/AEI for intermodal goods transport

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One possible instance of data resided in different components defined in this International Standard is illustrated in Figure B.1. See Annex B for example. (standards.iteh.ai)

6 Overview of data definitions

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[647e5511e778/iso-17262-2012](https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e5511e778/iso-17262-2012)

This clause contains an overview of the data content of ASN.1 types defined in this International Standard.

'Access Control Status'	'Terminal Monitoring Type'
— Access OK	—Entry
— Access denied	—Exit
—Access pending	—Loading
	—Unloading
'AEI Message Type'	—Stacking
— TimeReal	—Unstacking
— ReaderLocation	—Stuffing
— TerminalMonitoringType	—Stripping
— TransportObjectMessageType	—Registration
'Display Message Type'	'Transport Object Type'
— AccessControlStatus	—Goods item
— TransportObjectMessageType	—Package item
— MsgInfo	—Transport

'Position'	'Transport Object Identifier'
— x co-ordinate	— Issuer identifier
— y co-ordinate	— Manufacturer identifier
— z co-ordinate	— Licence plate number
	— Vehicle identification number
'Reader Location'	— Freight container number (ISO 10374)
— Reader identity	— Tax code
— Un/Locode	— Swap body structure (EN 13044)
— Geographic point location	— Freight conveyance identifier
— 'Position'	
	'Transport Object Message Type'
'Transport Component Status'	— 'Transport Object Identifier'
— OK	— Transport component status
— Malfunction	
— Battery low	

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'Swap body Structure' <https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e55111e77/iso-17262-2012>

- owner code
- equipment category identity
- serial number
- check digit
- length (in centimetres);
- height (in centimetres);
- width (in centimetres);
- container type code
- maximum gross mass (in hundreds of kilograms);
- tare mass (in hundreds of kilograms);

'Freight Land Conveyance Content Information'

- All data specified by ISO 26683 family of standards deliverables

- represented as specified in CS10

'ITS consignment in UBL format'

-represented as specified in CS11

7 Data definitions

In order to make the data defined within this International Standard valid for use in other RTTT/ITS application standards, the data content of ASN.1 types shall conform to that defined in ISO/IEC 8824 series. See Annex A for example.

Examples on encoding of data are described in Annex C. See Annex C for example.

7.1 'Access Control Status'

7.1.1 Description

'Access Control Status' is a code issued by the AEI manager to indicate the status of the access control of a transport means, load unit or a goods item to a terminal monitoring point.

7.1.2 ASN.1 type

```
AccessControlStatus ::= ENUMERATED {  
    accessOk (0),  
    accessDenied (1),  
    accessPending (2) --"Please wait" indication  
}
```

7.2 'AEI Message Type'

<https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e55111e77/iso-17262-2012>

7.2.1 Description

'AEI Message Type' is the complete message, which is transferred from the AEI reader to the AEI manager.

7.2.2 ASN.1 type

```
AEIMessageType ::= SEQUENCE {  
    TimeReal, -- Local time reference (precision in seconds)  
    ReaderLocation,  
    TerminalMonitoringType,  
    TransportObjectMessageType -- Transport Means, Package, Goods Item  
}
```

7.3 CS9 :SwapBodyStructure

7.3.1 Description

The 'Swap Body' data structure shall be based on EN 13044 and consist of the following:

- owner code, in accordance with EN 13044;
- equipment category identity, in accordance with EN 13044;
- serial number, in accordance with EN 13044;
- check digit, in accordance with EN 13044;
- length (in centimetres);

- height (in centimetres);
- width (in centimetres);
- container type code, in accordance with EN 13044;
- maximum gross mass (in hundreds of kilograms);
- tare mass (in hundreds of kilograms).

7.3.2 ASN.1 type

CS9 ::= SwapBodyStructure

```
SwapBodyStructure ::= SEQUENCE {
    ownerCode BIT STRING(SIZE(15)), -- EN 13044
    equipCategoryId BIT STRING(SIZE(3)), -- EN 13044
    serialNumber INTEGER(0 .. 1000000), -- EN 13044
    checkDigit INTEGER(0 .. 10), -- EN 13044
    length INTEGER(1 .. 2048), -- cm
    height INTEGER(1 .. 512), -- cm
    width INTEGER(200 .. 327), -- cm (7bits)
    containerTypeCode INTEGER(0 .. 63), -- EN 13044
    maximumGrossWeight INTEGER(1 .. 512), -- 100 kg
    tareWeight INTEGER(0 .. 63) -- 100 kg
}
```

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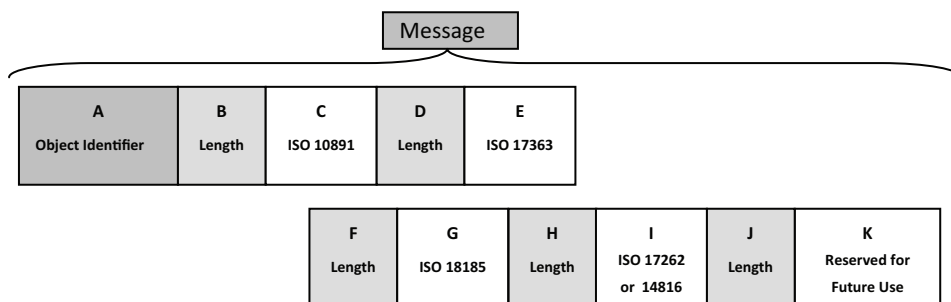
7.4 CS10 : 'Freight Land Conveyance Content Information'

[ISO 17262:2012](#)

7.4.1 Description <https://standards.iteh.ai/catalog/standards/sist/18607e58-bc72-4776-b47d-647e55111e77/iso-17262-2012>

The 'Freight conveyance identifier' is defined as an octet string that shall contain the corresponding identifier in ISO/TS 26683-2 compliant "Freight Conveyance Content Identification' data".

Suggested Data Element Structure (Example)



B – G : used for container

H, I : used for vehicle, chassis

J, K : used for cargo identifiers with general truck, other any purpose
from user perspective

7.4.2 ASN.1 type

```
CS10 ::= FreightConveyanceIdentifier
FreightConveyanceIdentifier ::= SEQUENCE {
    multipleFreightConveyanceIdentification MultipleFreightConveyanceIdentification,
    multipleLoadIdentification MultipleLoadIdentification
}
```

}

```
MultipleFreightConveyanceIdentification ::= SEQUENCE {
  identifierCode INTEGER {
    nofreightConveyanceIdentifier (0),
    freightContainerIdentification (1),
    multipleFreightContainerIdentification (2)
  } (0 .. 31),
  freightContainerTypeIdentification CS7
}
```

```
MultipleLoadIdentification ::= SEQUENCE{
  identifierCode INTEGER {
    noLoadIdentifier (0),
    transportMeansIdentification (1), --ISO14816
    intermodalGoodsTransportationIdentification (2), --ISO17262
    freightContainerIdentification (3), --ISO17363
    returnableTransportItemsIdentification (4), --ISO17364
    transportUnitsIdentification (5), --ISO17365
    productPackagingIdentification (6), --ISO17366
    goodsItemsIdentification (7), --ISO17367
    unused1 (8), -- 8-14 unused
    unused2 (9), -- 8-14 unused
    unused3 (10), -- 8-14 unused
    unused4 (11), -- 8-14 unused
    unused5 (12), -- 8-14 unused
    unused6 (13), -- 8-14 unused
    unused7 (14), -- 8-14 unused
    electronicSealsIdentification (15) --ISO18185
  } (0 .. 999)
  --16-999 Reserved for future use (0 .. 999)
  noLoadIdentifier PrintableString OPTIONAL,
  transportMeansIdentification PrintableString OPTIONAL,
  -- Automatic vehicle and equipment identification- Numbering and data structure,
  -- containing the corresponding identifier to be defined in ISO 14816,
  intermodalGoodsTransportationIdentification PrintableString OPTIONAL,
  --Automatic vehicle and equipment identification- Numbering and data structures,
  -- containing the corresponding identifier to be defined in ISO17262
  freightContainerIdentification PrintableString OPTIONAL,
  --Supply chain applications of RFID,
  --containing the corresponding identifier to be defined in ISO17363
  returnableTransportItemsIdentification PrintableString OPTIONAL,
  --Supply chain applications of RFID,
  --containing the corresponding identifier to be defined in ISO17364
  transportUnitsIdentification PrintableString OPTIONAL,
  --Supply chain applications of RFID,
  --containing the corresponding identifier to be defined in ISO17365
  productPckagingIdentification PrintableString OPTIONAL,
  --Supply chain applications of RFID,
  --containing the corresponding identifier to be defined in ISO17366
  goodsItemsIdentification PrintableString OPTIONAL,
  --Supply chain applications of RFID,
  --containing the corresponding identifier to be defined in ISO17367
  electronicSealsIdentification PrintableString OPTIONAL
  --Freight containers
  --Part 4: Data protection,
  -- containing the corresponding identifier to be defined in ISO18185
}
```

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7.5 CS11: ITS consignment in UBL format

7.5.1 Description

CS11 profiles how to populate the UBL transport library data concept : Transport Library::Consignment with data obtained from a freight land conveyance.

CS11 does not specify the air interface used to provide data, it solely provides the means to convert freight consignment data obtained by interrogating a freight land conveyance for data in the format specified by UBL Transport library data concept : 'Transport Library::Consignment' for all of the data concept or for or elements of this data concept as defined in UBL 2.1.

The use of CS11 is OPTIONAL.

In order to comply with ISO 17262, sequence of the OPTIONAL scripts is at the senders' choice (there is no required sequence in ISO 17262).

NOTE 1 These provisions are designed to provide the flexibility to enable only enable parts of the UBL::Consignment data concept to be stored on board and forwarded to a destination where they can be input to the compilation of a UBL data concept, but where it is impracticable or undesirable to hold the whole UML:consignment data concept on board; but to enable those parts stored to be in .xsd form compatible with that required in elements of the UBL::Consignment data concept.

However, in order to claim compliance to UBL2.1, additional discipline is required. Although the use of data element scripts in ISO 17272 is OPTIONAL, and there are no requirements as to sequence, in UBL version 2.1, their use may be mandatory (depending on cardinality), and the order of the sequence is mandatory as specified in UBL 2.1. Those wishing to claim compliance to UBL 2.1 shall refer and comply to <http://docs.oasis-open.org/ubl/prd1-UBL-2.1/UBL-2.1.xml> (Authoritative) or a subsequent version of UBL.

NOTE 2 UBL 2.1 Cardinality:

The optionality and potential occurrences of the BIE

Cardinality 0..1 – optional and only one

1 – mandatory and only one

Cardinality 0..n – optional and maximum of n

1..n - mandatory and maximum of n

where the letter 'n' represents an unlimited number, and an actual number in place of the letter 'n' is the maximum.

NOTE 3 BIE 'Business Information Entity'

In UBL 2.1 there are three BIE Types:

Basic BIE (BBIE --),

Associate BIE (ASBIE -- "an association"), and

Aggregate BIE (ABIE -- "an aggregate").

Figure 2 shows the data elements comprising ITS consignment in UBL format . The .xsd script for each element can be obtained from the ASN.1 type definition in 7.5.2 below.

UBL Name	Dictionary Entry Name
<i>Consignment</i>	<i>Consignment Details</i>
ID	Consignment. Identifier
CarrierAssignedID	Consignment. Carrier Assigned_ Identifier. Identifier
ConsigneeAssignedID	Consignment. Consignee Assigned_ Identifier. Identifier
ConsignorAssignedID	Consignment. Consignor Assigned_ Identifier. Identifier