Reference number of working document: **ISO/IEC JTC 1/SC 31 N 3184**

Date: 2010-05-17

Reference number of document: **ISO/FCD 15459-1.2**

Committee identification: ISO/IEC JTC /SC 31/WG 2

Secretariat: JISC

Information technology — Automatic identification and data capture techniques — Unique identification — Part 1: Individual transport units

Technologie d'information — Identification automatique et techniques de capture de données — Identification uniques — La partie 1: Unités individuelles de transport

Document type: International standard - Revision
Document subtype: if applicable
Document stage: (30) Committee
Document language: E

\\Vnjts248\public\James C Info Folder\SC 31 - v1.0\Document Information\N3000 - N3999\N3184\SC031-N-3184 - FCD Text 15459-1.doc Basic template BASICEN3 2002-06-01

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national 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 and IEC shall not be held responsible for identifying any or all such patent rights.

Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques* prepared ISO/IEC 15459-1.

ISO/IEC 15459 consists of the following parts, under the general title *Information technology — Automatic identification and data capture techniques — Unique identification*:

— *Part 1: Individual transport units*

— *Part 2: Registration procedures*

— *Part 3: Common rules*

— *Part 4: Individual products and product packages*

— *Part 5: Individual returnable transport items (RTIs)*

— *Part 6: Groupings*

Introduction

Unique identification can occur at many different levels, at item level, on the transport unit, on the returnable transport item, at grouping levels, and elsewhere. Such entities are often handled by several parties, both public and private, throughout their lifecycle Each of these parties must be able to identify and trace such distinct entities so that reference can be made to associated information such as quality inspection data, the chemical substance contained, the batch or lot number of parts, components or raw materials, etc.

The information is often held on computer systems, and may be exchanged between parties involved via EDI (Electronic Data Interchange) and XML (eXtensible Markup Language) messages.

There are considerable benefits if the identity of the entity is represented as a bar code or other AIDC (Automatic Identification and Data Capture) media and attached to or made a constituent part of that which is being uniquely identified so that

— it can be read electronically, thus minimising errors;

— one identity can be used by all parties;

— each party can use the identity to look up its computer files to find the data associated with the entity.

All AIDC technologies have the potential to encode an identity. It is expected that application standards, using various automatic identification technologies, will be developed based upon the identity as a prime key. These application standards, which may include additional rules for which level of identification should be used, may be made available from the Issuing Agency.

The identity for individual transport units defined in this part of ISO/IEC 15459 and represented in a one line linear bar code, two-dimensional symbol, RFID tag, or other AIDC media attached to the unit meets the needs defined in ISO/IEC 15459-3, Common rules.

Information technology — Automatic identification and data capture techniques — Unique identification — Part 1: Individual transport units

1 Scope

This part of ISO/IEC 15459 specifies a unique string of characters for the identification of individual transport units. The character string is intended to be represented in a bar code label or other AIDC media attached to the entity to meet management needs. To address management needs, different types of entities are recognized in the various parts of ISO/IEC 15459, which allows different requirements to be met by the identities associated with each type.

The rules for the unique identification for individual transport units, to identify physical logistical transfers, with the identity relevant for the duration of one or more items in the load being held or transported as part of that load, are defined and supported by example.

2 Normative references

The following referenced documents are indispensable for the application 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/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO/IEC 15418, *Information technology — Automatic identification and data capture techniques — GS1 Application identifiers and ASC MH 10 data identifiers and maintenance*

ISO/IEC 15434, *Information technology — Automatic identification and data capture techniques — Syntax for high-capacity ADC media*

ISO/IEC 15459-2, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 2: Registration procedures*

ISO/IEC 15459-3, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 3: Common rules*

ISO 17365, *Supply chain applications of RFID — Transport units*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Part 1: General terms relating to AIDC*

GS1 General Specifications, *GS1*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1 and ISO/IEC 15459-3 apply.

4 Qualifiers for individual transport units

Each individual transport unit shall be unambiguously identified by a qualifier and a string as defined in Clause 5 so that entities of this qualifier can be distinguished from other qualifiers, the string shall be combined with a qualifier determined by the Issuing Agency. The type of identity for an individual transport unit may be identified by one of the following qualifiers as defined in ISO/IEC 15418 or ISO/IEC 9384-1;

- The GS1 Application Identifier **00**
- One of the ASC MH 10 Data Identifiers from ANS MH10.8.2 Category 10, in the general range **J** to **6J**, which starts with an Issuing Agency Code

  NOTE If this method is used to create the identity each Issuing Agency or identity issuer if authorized by its Issuing Agency shall select only one DI from Category 10 to to act as the qualifier of the identity for the sub-type This should be the most appropriate DI for its application, taking into account the existing use and potential benefits of individual DIs specified in Category 10 of the ASC MH 10 data dictionary.

- When employing an ISO/IEC compliant high capacity AIDC data carrier an additional option is the object identifiers;

  — 1 0 15459 1: for a transport unit identity defined by the IAC. This is defined independent of, and unlike the structures below, does not support mapping to GS1 Application Identifiers and ASC MH 10 Data Identifiers.

  — 1 0 15459 1 1: for a transport unit qualifier equivalent to GS1 Application Identifier **00**

  — 1 0 15459 1 2: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **J**

  — 1 0 15459 1 3: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **1J**

  — 1 0 15459 1 4: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **2J**

  — 1 0 15459 1 5: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **3J**

  — 1 0 15459 1 6: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **4J**

  — 1 0 15459 1 7: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **5J**

  — 1 0 15459 1 8: for a transport unit qualifier equivalent to ASC MH10 Data Identifier **6J**

- When employing an ISO/IEC compliant high capacity AIDC data carrier an additional option is the use of application family identifiers (AFIs):

  — 10100010: for a transport unit, not containing hazardous material, qualifier for management needs defined by the IAC. Does not support mapping to GS1 EPC (Electronic Product Code).

  — 10100111: for a transport unit, containing hazardous material, qualifier for management needs defined by the IAC. Does not support mapping to GS1 EPC (Electronic Product Code).

5 Identity for individual transport units

5.1 General

An identity is assigned to an individual transport unit by an identity issuer. This shall be done in accordance with the rules established by an authorised Issuing Agency as defined in ISO/IEC 15459-3 and ISO/IEC 15459-2.

5.2 Maximum number of characters permissible in an identity

The identity for individual transport units shall not contain more than 50 characters.

For efficient use within various AIDC data carrier systems, it is recommended that the number of characters to be coded in a one line linear bar code symbol should not exceed 20 characters, and number of characters should be kept as short as possible regardless of the permissible maximum of 50 characters.

5.3 Permissible character sets in an identity

The identity shall only contain upper-case alphabetic characters and numeric digits of the invariant character set of ISO/IEC 646, see Annex A in ISO/IEC 15459-3.

NOTE An Issuing Agency may put additional restrictions on the repertoire for identities for transport units using its IAC.

Any data processing system shall be capable of processing identities using the full repertoire of characters permitted for identities for transport units.

6 Implementation of coding using AIDC media

All AIDC technologies have the potential to encode an identity. It is expected that application standards for entities, using various automatic identification technologies, will be developed based upon the ISO/IEC 15459 identity as a prime key. These application standards may be made available from the Issuing Agency.

Annex A
(informative)

Unique identification for transport units

A.1 Role of the Issuing Agency in providing application guidance for transport units

To illustrate the usage of individual identities for transport units, the hypothetical example is given using the two Issuing Agencies (IAs), recognised by the Registration Authority, GS1 and Dun & Bradstreet.

The construction of the string minimally includes the Issuing Agency Code (IAC), Company Identifying Number (CIN), and Identity (ID) assuming that the ID is unambiguous within the CIN. In some cases IDs are not unambiguous within the CIN but are unambiguous within a specific asset type under the control of a company. If the ID is not unambiguous within the company, the string must include a company asset type code, or similar. Thus the string established by the identity issuer cannot be the same as that established by another. Moreover, ISO/IEC 15459-2 ensures all the identities are unambiguous.

A.2 GS1 unique identification for transport units

The example below shows a GS1 string (18 characters SSCC) for transport units.

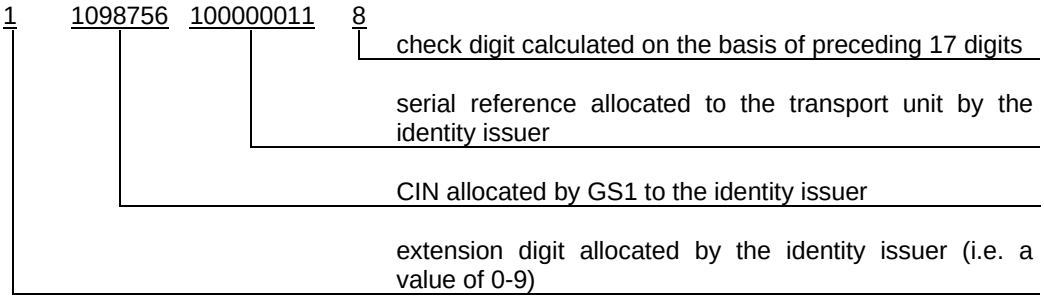

Figure A.1 — GS1 string

NOTE GS1 uses the term Company Prefix for the CIN allocated by GS1 to the unique identity issuer.

This string can be contained in a GS1-128 bar code symbol with the qualifier of GS1 Application Identifier “00”. The bar code symbol data will be as in Figure B.1 and, when scanned, can be expected to pass this data (Table A.1) to a computer system:

Table A.1 — Data stream — GS1

Symbology identifier	Identity	
	Qualifier	String
]C1	**00**	**110987561000000118**

NOTE The Application Identifier “00” is not included in the string, but included in the identity. The symbology identifier provides information on the data carrier used.

A.3 ASC MH10 unique identification for transport units

The example below shows an ASCH MH10 string for transport units, using the UPU as Issuing Agency (IA).

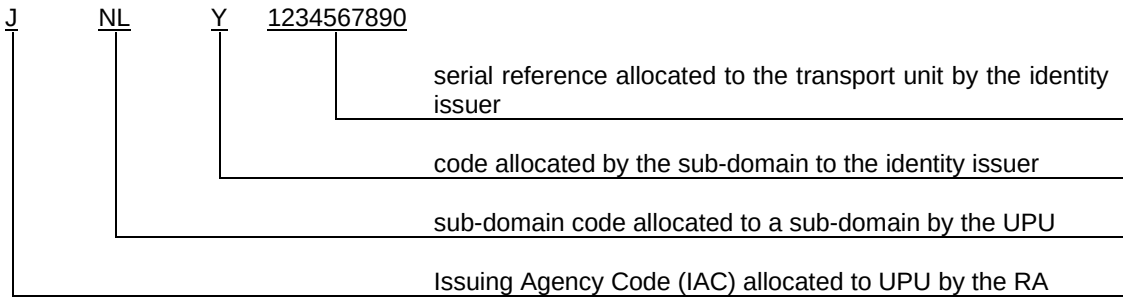

Figure A.2 — ASC MH10 string using UPU as IA

This string can be contained in a Code 128 bar code symbol with the qualifier of ASC MH10 Data Identifier “J” preceding the string. The bar code symbol data will be as in Figure B.2 and, when scanned, would be expected to pass this data to a computer system:

Table A.2 — Data stream — Data Identifier

Symbology identifier	Identity	
	Qualifier	String
]C0	**J**	**JLNY1234567890**

NOTE The Data Identifier ”J” is not included in the string, but is included in the identity. The symbology identifier provides information on the data carrier used.

Annex B
(informative)

Examples of identities for individual transport units

To illustrate the usage of identities, assume that two Issuing Agencies (IAs) are recognised by the Registration Authority (RA), say GS1 and the Universal Postal Union (UPU).

The rules of GS1 require that the identity string for transport units consists of 18 numeric characters where the first character (0, 1, 2...9) is allocated by the RA, the next characters are allocated by GS1 to the issuer of the identity and the following characters assigned by the issuer of the identity. The last character is a check digit calculated on the basis of the preceding 17 digits. See Figure B.1.

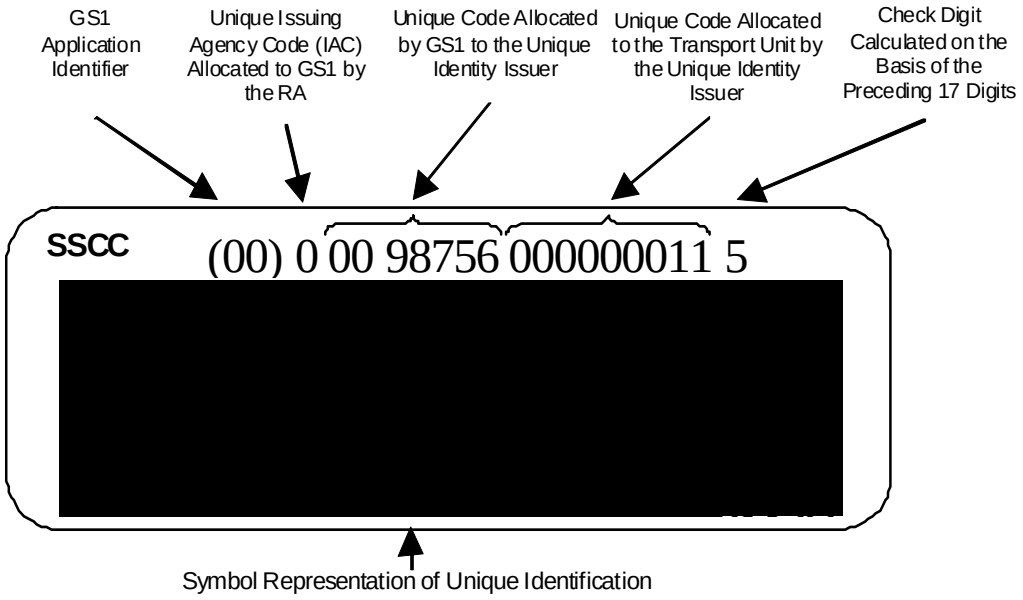

Figure B.1 — Representation of GS1 identity for transport units in a GS1-128 bar code symbol

The rules of the UPU are that the identity string consists of no more than 35 alpha-numeric characters, where the first character is the Issuing Agency Code “J” allocated by the Registration Authority to the UPU. The next characters are allocated by the UPU to create and identify a sub-domain. A number of different structures are defined in the relevant UPU Standards. One of these utilises two-character ISO 3166 Country Codes to create sub-domains for the National Postal Administration in each country. This “Postal Administration Identity” is followed by a free format zone in which each Postal Administration may define an own structure, as long as the structure is in compliance with the framework of this Standard. See Figure B.2.

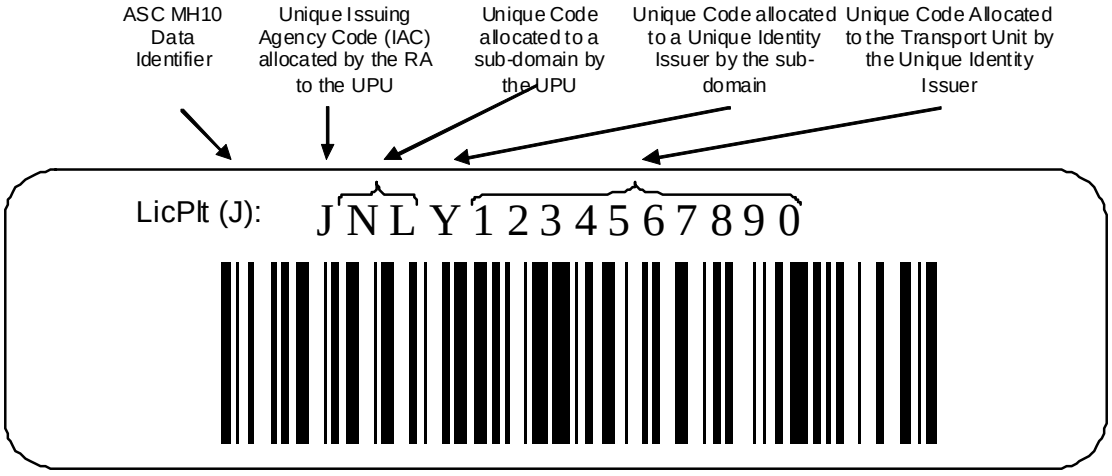

Figure B.2 — Representation of UPU identity for transport units in a Code 128 bar code

Thus the identity for a transport unit created by the identity issuer can not be the same as the identity for a transport unit created by another identity issuer. Moreover, ISO/IEC 15459-2 ensures that all identities for individual transport units are unambiguous within their qualifier.

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[5] ISO/IEC 15459-5, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 5: Individual returnable transport items (RTIs)*

[6] ISO/IEC 15459-6, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 6: Groupings*

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