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**Information technology — Transfer syntax  
for high capacity ADC media**

*Technologies de l'information — Syntaxe de transfert pour supports ADC à  
haute capacité*

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Printed in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. 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 International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 15434 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

Annex A of this International Standard is for information only.

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## Introduction

This International Standard defines the manner in which the data is transferred to the high capacity ADC media from a supplier's information system and the manner in which the data is transferred to the recipient's information system. This International Standard does not define the internal data storage format for specific high capacity ADC media. This International Standard does not specify the application of data structures provided by a specific data syntax format. The application of the data structure is specified by industry conventions.

Users of automatic data capture (ADC) technologies benefit by being able to receive data in a standard form and by being able to provide data in a standard form. Static ADC technologies such as bar code symbologies, magnetic stripe, optical character recognition, surface acoustical wave (SAW), and Weigand effect typically encode a single field of data. Most applications of these technologies involve the encoding of a single field of datum by the supplier of the medium and the subsequent decoding of the datum field by the recipient. Encoding single fields of data permit the supplier to perform the encodation from a single field within the supplier's information system. Decoding single fields of data permit the recipient to input this data into a single field into the recipient's information system, in lieu of key entry.

High capacity ADC technologies, such as two-dimensional symbols, RFID transponders, contact memories, and smart cards encode multiple fields of data. These multiple fields usually are parsed by the recipient's information system and then mapped to specific fields of data in recipient's information system. It is the purpose of this International Standard to define the syntax for high capacity ADC media, so as to enable ADC users to utilize a single mapping utility, regardless of which high capacity ADC media is employed.

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# Information technology — Transfer syntax for high capacity ADC media

## 1 Scope

This International Standard specifies a transfer structure, syntax, and coding of messages and data formats when using high capacity ADC media between trading partners, specifically between suppliers and recipients, and where applicable, in support of carrier applications, such as bills of lading and carrier sortation and tracking;

The data encoded pursuant to this International Standard includes:

- That which may be used in the shipping, receiving, and inventory of transport units.
- That which may be contained within supporting documentation, in paper or electronic form, related to unit loads or transport packages.
- That which may be used in the sortation and tracking of transport units.

This International Standard describes the ASCII (ISO 646) data transfer syntax for automatic data capture. Where ASCII is not the transfer syntax of choice for transfer this International Standard does not apply. An example of this is in the case where ASN.1 (ISO 8824-1 through 4 and ISO 8825-1 and 8825-2) is applied for RFID purposes.<sup>1</sup>

This International Standard does not apply when there is a symbology, standardized by ISO, reserved for a given transfer syntax.

This International Standard does not supersede or replace any applicable safety or regulatory marking or labeling requirements. This International Standard is to be applied in addition to any other mandated labeling requirements.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 646,	<i>Information technology — ISO 7-bit coded character set for information interchange.</i>
ISO/IEC 2382 (all parts),	<i>Information technology — Vocabulary.</i>
ISO/IEC 8824-1,	<i>Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation.</i>
ISO/IEC 8824-2,	<i>Information technology — Abstract Syntax Notation One (ASN.1): Information object specification.</i>
ISO/IEC 8824-3,	<i>Information technology — Abstract Syntax Notation One (ASN.1): Constraint specification.</i>
ISO/IEC 8824-4,	<i>Information technology — Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.</i>
ISO/IEC 8825-1,	<i>Information technology — ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).</i>
ISO/IEC 8825-2,	<i>Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER).</i>
ISO 9735 (all parts),	<i>Electronic data interchange for administration, commerce, and transportation (EDIFACT) — Application level syntax rules (Syntax version number: 4).</i>

<sup>1</sup> This statement does not imply that ASN.1 is the required syntax for RFID.

ISO/IEC 15418,	<i>Information technology — Automatic Identification and Data Capture Techniques — International Specification — Data Application Identifiers.</i>
CEN EN 1556,	<i>Terminology.</i>
IATA Resolution 606,	<i>Cargo Label.</i>
ANSI X12,	<i>Electronic Data Interchange — United States.</i>
CII Syntax Rule (Vers 3.00),	<i>CII Syntax Rule Specifications (3.00) (Electronic Data Interchange — Japan).</i>
ANSI MH10.8.2,	<i>Data Application Identifiers.</i>
ANSI UCC 4,	<i>Application Identifiers.</i>
ANSI MH10.8.3M,	<i>Two-dimensional Symbols with unit loads and transport packages.</i>

### 3 Definitions

For the purposes of this International Standard, the definitions given in CEN EN 1556 and ISO/IEC 2382 apply.

<b>Document Notation Conventions:</b>	
This International Standard uses the following typographical conventions in message examples	
• <b>BOLD, ALL CAPITALS</b>	Text that must be entered exactly as it appears (In this International Standard, <sup>F</sup> <sub>S</sub> , <sup>G</sup> <sub>S</sub> , <sup>U</sup> <sub>S</sub> , <sup>R</sup> <sub>S</sub> , <sup>E</sup> <sub>OT</sub> are used to represent non-printable special characters. The ASCII representation of special characters used in this International Standard can be found in Annex A.);
• <i>italic, lower case</i>	Variable Parameters. The user must supply an appropriate value. In some cases default values are recommended in this International Standard.

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### 4 Message Format

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This clause defines how data shall be transferred from a High Capacity ADC Media reading device to the user's application software.

To allow multiple data Formats to be contained within a data stream, a two level structure of enveloping is employed. The outermost layer of the message is a Message Envelope that defines the beginning and end of the message. Within the Message Envelope are one or more Format Envelopes that contain the data. (See Figure 1). Multiple formats in a single message should only be employed with bi-lateral agreements of the trading partners.

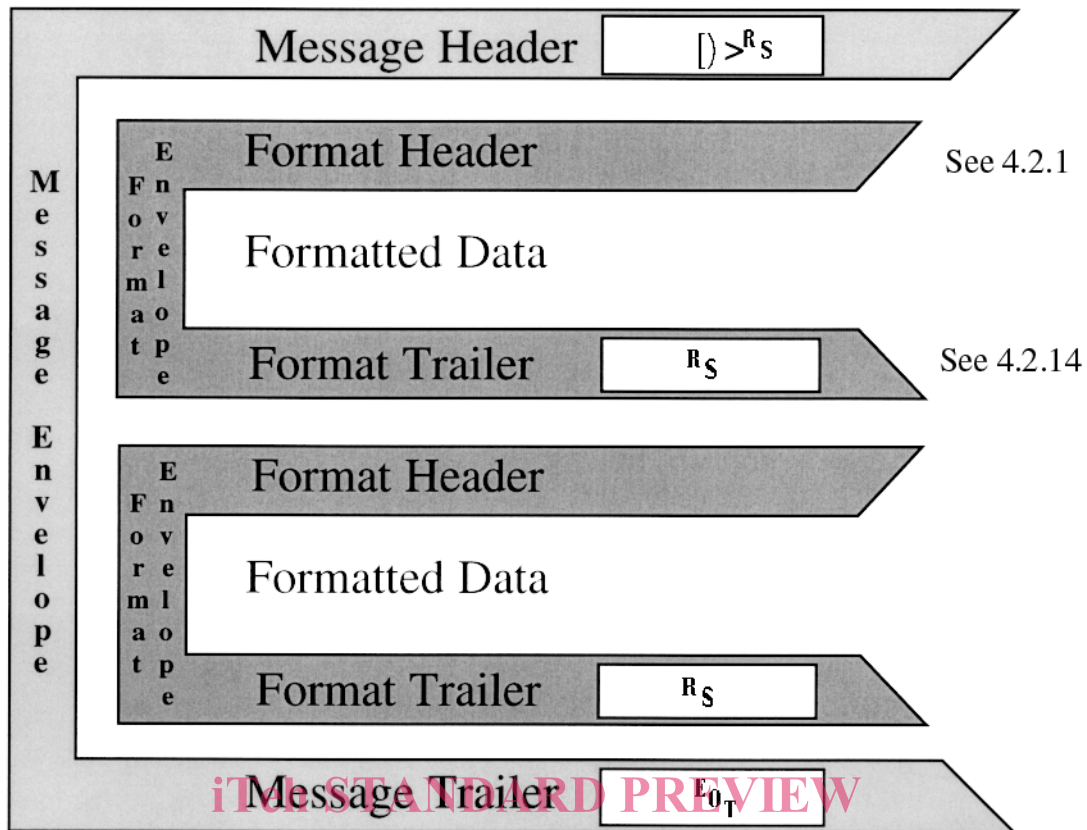
The Message Envelope shall consist of

- A Message Header,
- One or more Format Envelope(s), and,
- A Message Trailer (when required).

Each Format Envelope within the Message Envelope shall consist of,

- A Format Header,
- Data, formatted according to the rules defined for that Format, and,
- A Format Trailer (when required).





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Figure 1 — Enveloping Structure

(Annex A shows the Decimal and Hexadecimal values of ASCII characters)

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#### 4.1 Message Envelope

The Message Envelope defines the start and end of the data contained within the data stream, and provides the following functions:

- Indication that the message contained within this media is formatted in compliance with the rules of this International Standard
- Indicates the character which has been defined to separate Formats within this Message.
- Provide an unique character to indicate the end of the Message.

The structure within a data stream is as follows:

A Message, containing one or more Formats

A Format, containing one or more Segments

A Segment, containing one or more Data Elements

A Data Element (Field), potentially containing one or more Sub-elements (Sub-fields).

##### 4.1.1 Message Header

The Message Header consists of two parts:

- the three character Compliance Indicator, and
- the Format Trailer Character

The complete Message Header is:  $[ ] > R_S$

##### 4.1.1.1 Compliance Indicator

The Compliance Indicator shall be the first three characters in the Message Header. The Compliance Indicator shall be  $[ ] >$  (left bracket, right parenthesis, and greater than). See Annex A for a table of ASCII decimal and hexadecimal values.

#### 4.1.1.2 Format Trailer Character

The Format Trailer Character shall be the fourth character in the Message Header. The Format Trailer Character shall be the non-printable ASCII character "R<sub>S</sub>" (see Annex A). The Format Trailer Character is used throughout the message to indicate the end of a data Format envelope. (See 4.2.15).

#### 4.1.2 Message Trailer

The Message Trailer identifies the end of the message within the data stream. The Message Trailer shall be the End Of Transaction character, "E<sub>O<sub>T</sub></sub>" (see Annex A). The Message Trailer character shall not be used elsewhere in the message except in Format "09" (binary data) and Format "11" (ASN.1 value) where the "E<sub>O<sub>T</sub></sub>" character may appear.

The Message Trailer shall **not** be used with Formats "02" (Complete EDI message / transaction) and "08" (Structured data using CII Syntax Rules).

#### 4.2 Format Envelope

The Format Envelope defines the start and end of data in a given Format and provides the following functions:

- Identifies the data Format used within the envelope,
- Defines the character(s) used to separate the Segments, Data Elements (Fields), and Sub-elements (Sub-fields) within this data Format, and,
- Indicates any applicable date, release, or control information.

#### 4.2.1 Format Header

A Format Header shall consist of two parts:

- A Format Indicator (a two-digit numeric identifier which identifies the rules governing the Format), and
- Variable data (if any) which defines the separators used and version and release, date, or control information of the applicable standards.

Table 1 lists the Format Indicators and variable data associated with the Format Header.

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Table 1 — Format Header Table Showing Recommended Separators

Format Indicator	Variable Header Data	Format Trailer	Format Description
00			Reserved for future use
01	$G_{svv}$	$R_S$	Carrier sortation & tracking
02			Complete EDI message / transaction
03	$vvvrrr^F G_S U_S$	$R_S$	Structured data using ANSI ASC X12 Segments
04	$vvvrrr^F G_S U_S$	$R_S$	Structured data using UN/EDIFACT Segments
05	$G_S$	$R_S$	Data using EAN/UCC Application Identifiers
06	$G_S$	$R_S$	Data using Data Identifiers <sup>2</sup>
07		$R_S$	Free form text
08	$vvvrrmn$		Structured data using CII Syntax Rules
09	$G_{sttt...t} G_{sccc...c} G_{snnn...n} G_S$	$R_S$	Binary data (file type) (compression technique) (number of bytes)
10			Reserved for future use
11	$bbb...b G_S$		Structured data using ASN.1
12-99			Reserved for future use

- vv represents the two-digit version of Format "01" being used
- $R_S$  - represents the Format Trailer character (See 4.2.15).
- $F_S$  - represents the Segment Terminator (See 4.2.1.1.1).
- $G_S$  - represents the Data Element Separator (See 4.2.1.1.2).
- $U_S$  - represents the Sub-Element Separator (See 4.2.1.1.3).
- vvvrrr represents the three digit Version (vvv) followed by the three digit Release (rrr) (See 4.2.5).
- vvvrrmn represents the four digit Version (vvvv) followed by the two digit Release (rr) followed by the two digit Edition indicator (nn) (See 4.2.10).
- ttt...t represents the file type name (See 4.2.11).
- ccc...c represents the compression technique name (See 4.2.11).
- nnn...n represents the number of bytes (See 4.2.11).
- bbb...b represents the number of bytes (See 4.2.13).

#### 4.2.1.1 Separators and Terminators

The Separators and Terminators are an integral part of the data stream. The Separator and Terminator characters shall not be used in non-binary data elsewhere in the message. For binary data strings (Format "09") and ASN.1 values (Format "11"), special considerations apply (see 4.2.11 and 4.2.13, respectively).

##### 4.2.1.1.1 Segment Terminator

Each segment in Format "03" shall be terminated by the Segment Terminator character, the non-printable character " $F_S$ " (see Annex A).

##### 4.2.1.1.2 Data Element Separator

Data elements in Formats "01," "03," "05," and "06" shall be separated by the Data Element Separator, the non-printable character " $G_S$ " (see Annex A).

<sup>2</sup> Previously known as FACT Data Identifiers.