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Information technology — Automatic identification and data capture techniques — Data carrier identifiers (including symbology identifiers)

Technologies de l'information — Techniques automatiques d'identification et de capture des données — Identifiants de porteuses de données (y compris les identifiants de symbologie)

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Foreword

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

This third edition cancels and replaces the second edition (ISO/IEC 15424:2008), which has been technically revised.

The main changes are as follows:

— several new symbologies have been added;

— references to AIM as a registration authority have been removed;

— the extension method has been simplified.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

There is a need to identify the data carrier that a reader detects in autodiscrimination environments. The symbology identifier concept provides a standardized way for a device receiving data from a reader to differentiate between the data carriers. This document deals mostly with bar code symbologies; the terms symbology identifier, symbology and bar code are therefore used throughout this document although they are intended to apply to other data carriers as well.

This identification is achieved by the addition of an optional feature to readers enabling the reader to prefix a standard string of characters to data messages. This preamble contains information about the decoded symbol (or other data carrier) and any processing the reader has done. The information is not encoded or otherwise explicitly or implicitly represented in the symbol, except that the presence of some optional features can be detected by the reading equipment, whereas others require the reader to be expressly configured to implement them.

This document identifies symbologies for which a symbology specification

— is published in international standardization organisations, such as ISO, IEC and AIM Inc., or

— is proprietary but used in public applications.

In addition, there is a fixed number of symbologies which do not have a full standard but do have a reference document available from AIM Inc. These symbologies are included in this document because of their historical usage.

This document is intended to be read in conjunction with the relevant symbology specifications.

Information technology — Automatic identification and data capture techniques — Data carrier identifiers (including symbology identifiers)

1 Scope

This document specifies the preamble message generated by the reader and interpretable by the receiving system, which indicates the bar code symbology or other origin of transmitted data, together with details of certain specified optional processing features associated with the data message.

This document applies to automatic identification device communication conventions and standardizes the reporting of data carriers from bar code readers and other automatic identification equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
code character
second character in the symbology identifier string, which usually indicates to the host the bar code symbology of the symbol which has been read

3.1.2
flag character
first character in the symbology identifier string, which indicates to the host that it and the characters following are the symbology identifier characters

3.1.3
modifier character
character following the *code character* (3.1.1) in the symbology identifier string, indicating optional features or processing applied to the symbol

3.1.4
function 1
FNC1
special function character used for specific purposes in certain symbologies

Note 1 to entry: See Annex B.

3.2 Abbreviated terms

ASCII   American Standard Code for Information Interchange

DMRE   data matrix rectangular extension

ECI   extended channel interpretation

OCR   optical character recognition

RF   radio frequency

4 Requirements

4.1 Applicability

4.2 Structure

The symbology identifier shall be an ASCII character string prefixed by the reading equipment to the data contained in a bar code symbol.

The structure of the symbology identifier string shall be as follows:

]cm...

where

]   (ASCII value 93) represents the symbology identifier flag character;

c   represents the code character as defined in Table 1;

m   represents the single modifier character as defined for the symbology in question.

NOTE   The sign] is the character assigned to ASCII value 93 in the United States ASCII character set in according to ISO/IEC 646.

If a reader is enabled to transmit symbology identifiers, it shall always transmit a symbology identifier at the beginning of each message. The application must know whether or not the reader has symbology identifiers enabled. Therefore, the symbol data may start with a] and still be interpreted unambiguously.

4.3 Code characters

Code characters shall be drawn from the set of upper- and lower-case alphabetic letters A through Z (ASCII values 65 through 90) and a through z (ASCII values 97 through 122). The currently assigned code characters are listed in Table 1. These code characters are case sensitive, i.e. a capital "A" is a different code character from a lower case "a".

The code character Y has not been assigned to a specific symbology but is assigned to system extension in this document. The first character following Y will be the first code character of the future symbology followed by a one-character modifier. All code characters not given in this document are reserved for future use.

Certain symbologies emulate the data content of other symbologies, using their assigned symbology identifier, see Annex A. For symbology description references, see Annex C.

Table 1 — Code characters

Code character	Symbology	Code character	Symbology
A	Code 39	a	reserved
B	Telepen	b	reserved
C	Code 128	c	Channel Code
D	Code One	d	Data Matrix and DMRE
E	EAN/UPC	e	GS1 DataBar and GS1 Composite
F	Codabar	f	reserved
G	Code 93 and 93i	g	Grid Matrix
H	Code 11	h	Han Xin Code
I	Interleaved 2 of 5	i	reserved
J	DotCode	j	JAB Code
K	Code 16K	k	reserved
L	PDF417 and MicroPDF417	l	reserved
M	MSI	m	Modulated Height Postal
N	Anker	n	reserved
O	Codablock	o	OCR (Optical Character Recognition)
P	Plessey Code	p	PosiCode
Q	QR Code or rMQR	q	reserved
R	Straight 2 of 5 (with two bar start/stop codes)	r	Datastrip 2D
S	Straight 2 of 5 (with three bar start/stop codes)	s	SuperCode
T	Code 49	t	reserved
U	MaxiCode	u	Ultracode
V	reserved	v	reserved
W	DMRC Code	w	reserved
X	Other bar code	x	reserved
Y	System expansion	y	reserved
Z	Non-bar code	z	Aztec Code

4.4 Modifier character

4.4.1 General

Some symbologies covered by this document contain optional features which need to be indicated to the receiving equipment to enable them to be correctly processed. This optional processing is indicated by the modifier character.

Each symbology has a different set of optional features. These are listed in the following subclauses.

To determine the modifier character for an application, refer to the subclause corresponding to the symbology concerned. Listed in this subclause can be one or more processing options, each of which has an assigned option value. The precise interpretation of the option should be obtained by reference to the relevant symbology specification. The modifier character defines the options available for the code character. The modifier character and its meaning are defined for each of the code characters. The modifier character shall be from the set {0 to 9, A to Z, a to z}; in some instances, the character may represent a hexadecimal value (0 to F) corresponding to the sum of active processing options.

Where no options are indicated in the subclauses, the modifier character to be transmitted is 0. Values which are not included in the modifier values of a subclause are reserved for future use.

Check character options listed in the subclauses below indicate the basis of calculation of the check character, where a check character algorithm has been defined in the symbology specification or reference document.

Symbologies that support the ECI protocol have one or more modifiers to indicate that the ECI protocol is being used. Unless otherwise stated, the default ECI interpretation for these symbologies is \000003.

4.4.2   Code 39 — Code character: A

Modifier character value	Option
0	No check character validation nor full ASCII processing; all data transmitted as decoded
1	Modulo 43 check character validated and transmitted
3	Modulo 43 check character validated but not transmitted
4	Full ASCII character conversion performed; no check character validation
5	Full ASCII character conversion performed; modulo 43 check character validated and transmitted
7	Full ASCII character conversion performed; modulo 43 check character validated but not transmitted

4.4.3   Telepen — Code character: B

Modifier character value	Option
0	Full ASCII mode
1	Double density numeric only mode
2	Double density numeric followed by full ASCII
4	Full ASCII followed by double density numeric

4.4.4   Code 128 — Code character: C

Modifier character value	Option
0	Standard data packet; no FNC1 in first or second symbol character position after start character
1	GS1-128 data packet - FNC1 in first symbol character position after start character
2	FNC1 in second symbol character position after start character
4	Concatenation according to International Society for Blood Transfusion ISBT 128[6] specifications has been performed; concatenated data follows

4.4.5   Channel code — Code character: c

Modifier character value	Option
3	Channel 3 decoded
4	Channel 4 decoded
5	Channel 5 decoded
6	Channel 6 decoded
7	Channel 7 decoded
8	Channel 8 decoded
9	Composite format