INTERNATIONAL STANDARD

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Second edition
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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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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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 shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 15424 was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 15424:2000), which has been technically revised.

Introduction

The need exists to identify the data carrier 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 International Standard deals mostly with bar code symbologies; the terms Symbology Identifier, symbology, and bar code are therefore used throughout this International Standard 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 may be detected by the reading equipment, whereas others require the reader to be expressly configured to implement them.

This International Standard 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 International Standard applies to automatic identification device communication conventions and standardizes the reporting of data carriers from bar code readers and other automatic identification equipment. It specifies a 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.

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 646:1991, *Information technology — ISO 7-bit coded character set for information interchange*

ISO/IEC 19762 (all parts), *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

AIM Inc. International Technical Specification: *Extended Channel Interpretations — Part 1: Identification Schemes and Protocols*

AIM Inc. International Technical Specification: *Extended Channel Interpretations — Part 2: Registration Procedure for Coded Character Sets and Other Data Formats*

AIM Inc. International Technical Specification: *Extended Channel Interpretations — Character Set Register*

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.

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(s)
one or more characters following the code character in the symbology identifier string, indicating optional features or processing applied to the symbol

3.1.4
FNC1, FNC2, FNC3, FNC4
special function character used for specific purposes in certain symbologies

3.2 Abbreviated terms

3.2.1
ECI
Extended Channel Interpretations

3.2.2
OCR
Optical Character Recognition

3.2.3
RF
Radio Frequency

4 Requirements

4.1 Applicability

This International Standard identifies symbologies for which a symbology specification has been published by ISO/IEC JTC 1, AIM Global, or another recognized international standards body. 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 Global. These symbologies are included in this International Standard because of their historical usage.

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 modifier character(s) 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 accordance with 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.

When these ASCII characters are transmitted in a 16-bit (double byte) system, an 8-bit byte of all zeros shall be transmitted before each of the above ASCII characters (bytes).

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 is not assigned to a specific symbology but will be used for system expansion. The first modifier character following Y will be a digit from 1 to 9 defining the number of remaining modifier characters in the symbology identifier prefix string.

All code characters not given here are reserved for future use. Maintenance of the list of code characters (and of options given in 4.3) shall be in accordance with annex A of this International Standard.

Certain symbologies emulate the data content of other symbologies, using their assigned symbology identifier. See annex B.

Table 1 — Code characters

Code char.	Symbology	Code char.	Symbology
A	Code 39	a	reserved
B	Telepen	b	reserved
C	Code 128	c	Channel Code
D	Code One	d	Data Matrix
E	EAN/UPC	e	RSS and EAN.UCC Composite
F	Codabar	f	reserved
G	Code 93	g	reserved
H	Code 11	h	reserved
I	Interleaved 2 of 5	i	reserved
J	reserved	j	reserved
K	Code 16K	k	reserved
L	PDF417 and MicroPDF417	l	reserved
M	MSI	m	reserved
N	Anker	n	reserved
O	Codablock	o	OCR (Optical Character Recognition)
P	Plessey Code	p	PosiCode
Q	QR Code and QR Code 2005	q	reserved
R	Straight 2 of 5 (with two bar start/stop codes)	r	reserved
S	Straight 2 of 5 (with three bar start/stop codes)	s	SuperCode
T	Code 49	t	reserved
U	MaxiCode	u	reserved
V	reserved	v	reserved
W	reserved	w	reserved
X	Other bar code	x	reserved
Y	System expansion	y	reserved
Z	Non-bar code	z	Aztec Code

4.4 Modifier characters

Some symbologies covered by this International Standard 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(s).

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

To determine the modifier character(s) for an application, refer to the subclause corresponding to the symbology concerned. Listed in this subclause may 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 characters define the options available for the code character. The number of modifier characters and their meaning is defined for each of the code characters. The first 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.

4.4.1 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

4.4.2 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

4.4.3 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 specifications has been performed; concatenated data follows

4.4.4 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

4.4.5 Code One

Code character: **D**

Modifier character value	*Option*
0	No special characters in first or second symbol character position
1	FNC1 implied in first symbol character position
2	FNC1 in second symbol character position
4	Pad character in first symbol character position. The first data character in the symbol will define the escape character. When this character is a \ it indicates that the symbol contains ECI escape sequences.

4.4.6 Data Matrix

Code character: **d**

Modifier character value	*Option*
0	ECC 000 to ECC 140
1	ECC 200
2	ECC 200, FNC1 in first or fifth position
3	ECC 200, FNC1 in second or sixth position
4	ECC 200, ECI protocol implemented
5	ECC 200, FNC1 in first or fifth position, ECI protocol implemented
6	ECC 200, FNC1 in second or sixth position, ECI protocol implemented