
**Information technology — Automatic
identification and data capture
techniques — Code 128 bar code
symbology specification —**

*Technologies de l'information — Techniques d'identification
automatique et de capture des données — Spécifications des
symbologies des codes à barres, code 128*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 15417:2007](https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 15417:2007](https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements	2
Annex A (normative) Additional features of Code 128	15
Annex B (normative) Special considerations relating to Function Code 1 (FNC1)	16
Annex C (normative) Symbology identifiers	18
Annex D (informative) Relationship of symbol character value to ASCII value	19
Annex E (informative) Use of Start, Code Set and Shift characters to minimize symbol width	20
Annex F (informative) ISO/IEC 8859-1 (Latin Alphabet no. 1) character set	21
Annex G (informative) User-defined application parameters	22
Annex H (informative) Guidelines for the use of Code 128	23
Bibliography	25

[ISO/IEC 15417:2007](https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

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.

ISO/IEC 15417 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 15417:2000), which has been technically revised.

[ISO/IEC 15417:2007](https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

Introduction

The technology of bar coding is based on the recognition of patterns encoded in bars and spaces of defined dimensions. There are numerous methods of encoding information in bar code form, known as symbologies. Code 128 is one such symbology. The rules defining the translation of characters into bar and space patterns, and other essential features of each symbology, are known as the symbology specification.

In the past, symbology specifications were developed and published by a number of organizations, resulting in certain instances in conflicting requirements for certain symbologies.

Manufacturers of bar code equipment and users of bar code technology require publicly available standard symbology specifications to which they can refer when developing equipment and software.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/IEC 15417:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 15417:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

Information technology — Automatic identification and data capture techniques — Code 128 bar code symbology specification

1 Scope

This International Standard specifies the requirements for the bar code symbology known as Code 128. It specifies Code 128 symbology characteristics, data character encodation, dimensions, decoding algorithms and the parameters to be defined by applications. It specifies the symbology identifier prefix strings for Code 128 symbols.

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 8859-1, *Information technology — ISO 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1* <https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

ISO/IEC 15416, *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Linear symbols*

ISO/IEC 15424, *Information technology — Automatic identification and data capture techniques — Data Carrier Identifiers (including Symbology Identifiers)*

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

ISO/IEC 19762-2, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1 and ISO/IEC 19762-2 apply.

4 Requirements

4.1 Symbology characteristics

The characteristics of Code 128 are as follows.

a) Encodable character set:

- 1) All 128 ISO/IEC 646 characters, i.e. characters 0 to 127 inclusive, in accordance with ISO/IEC 646.

NOTE This version consists of the G0 set of ISO/IEC 646 and the C0 set of ISO/IEC 6429 with values 28 – 31 modified to FS, GS, RS and US respectively.

- 2) Characters with byte values 128 to 255 may also be encoded.

- 3) 4 non-data function characters.

- 4) 4 code set selection characters.

- 5) 3 Start characters.

- 6) 1 Stop character.

b) Code type: Continuous.

c) Elements per symbol character: 6, comprising 3 bars and 3 spaces, each of 1, 2, 3 or 4 modules in width (Stop character: 7 elements comprising 4 bars and 3 spaces).

d) Character self-checking: Yes.

e) Symbol length: Variable. <https://standards.iteh.ai/catalog/standards/sist/a1e82dff-aac7-4291-9f42-5240550125b5/iso-iec-15417-2007>

f) Bidirectionally decodable: Yes.

g) Symbol check character: One, mandatory (see A.1).

h) Data character density: 11 modules per symbol character (5,5 modules per numeric character).

i) Non-data overhead: Equivalent to 35 modules.

4.2 Symbol structure

Code 128 symbols shall comprise

- a) a leading quiet zone,
- b) a Start character,
- c) one or more characters representing data and special characters,
- d) a symbol check character,
- e) a Stop character,
- f) a trailing quiet zone.

Figure 1 illustrates a Code 128 symbol encoding the text "AIM".



Figure 1 — Code 128 symbol

4.3 Character encodation

4.3.1 Symbol character structure

Each symbol character comprises six elements (three bars and three spaces arranged alternately from left to right, commencing with a bar), each of which is 1, 2, 3 or 4 modules wide, with a total width of 11 modules. The sum of the bar modules in any symbol character is always even (even parity) and that of the space modules is therefore always odd. This parity feature enables character self-checking to be carried out. The Stop character comprises an additional bar element two modules wide making its total width 13 modules.

Each symbol character is assigned a numeric value listed in Table 1. This value is used in calculating the symbol check character value. It may also be used to provide a conversion to and from ISO/IEC 646 values (see Annex D). Table 1 defines all the Code 128 character assignments. In the column headed 'Element Widths' the numeric values represent the widths of the elements in modules or multiples of the X dimension.

Figure 2 below illustrates Start character A.

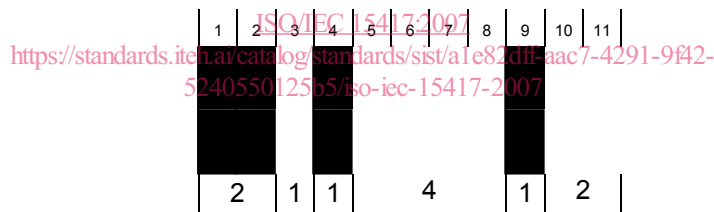


Figure 2 — Code 128 Start character A

Figure 3 below illustrates the encodation of the symbol character value 35, which represents data character 'C' in Code Sets A or B or the two digits '35' in Code Set C.

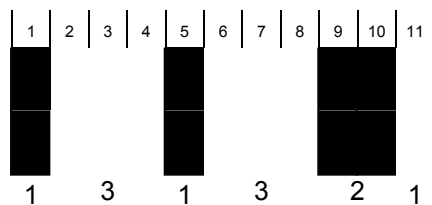


Figure 3 — Code 128 symbol character value 35

Figure 4 below illustrates the Stop character.

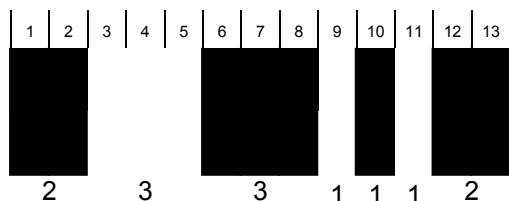


Figure 4 — Code 128 Stop character

4.3.2 Data character encodation

Code 128 has three unique data character code sets shown in Table 1 as Code Sets A, B, and C, each comprising a subset of the ISO/IEC 646 IRV character set together with various auxiliary characters. The symbol character bar and space patterns shown represent the data characters listed in the columns for Code Set A, B, or C. The choice of code set depends on the Start character or, within the symbol, on the use of Code A, Code B or Code C characters or the Shift character. If the symbol begins with Start character A, then Code Set A is defined initially. Code Set B and Code Set C are similarly defined by beginning the symbol with Start character B or C respectively. The code set can be redefined within the symbol by the use of Code A, Code B, and Code C characters or the Shift character (see 4.3.4.1 for the use of these special characters).

The same data may be represented by different Code 128 symbols, through the use of different combinations of Start, Code Set, and Shift characters. An application should not specify the code set to be used. Annex E contains rules to minimize the length of the symbol for any given data. A decoder shall in addition decode symbols which use valid combinations of Start, Code Set, and Shift characters and data other than that derived from the application of the algorithm in Annex E, such as a symbol with a code set or Shift character at the end of the data.

ISO/IEC 15417:2007
Table 1 — Code 128 character encodation
<https://standards.itec.ai/catalog/standards/sstd/15417-2007>

SYMBOL CHAR. VALUE	CODE SET A	ISO/IEC 646 VALUE for Set A	CODE SET B	ISO/IEC 646 VALUE for Set B	CODE SET C	ELEMENT WIDTHS (modules)						ELEMENT PATTERN																						
						B		S		B		S																						
						B	S	B	S	B	S	1	2	3	4	5	6	7	8	9	10	11												
0	space	32	space	32	00	2	1	2	2	2	2	█	█		█	█		█	█															
1	!	33	!	33	01	2	2	2	1	2	2	█	█			█	█		█	█														
2	"	34	"	34	02	2	2	2	2	2	1	█	█			█	█			█	█													
3	#	35	#	35	03	1	2	1	2	2	3	█			█					█	█													
4	\$	36	\$	36	04	1	2	1	3	2	2	█			█						█	█												
5	%	37	%	37	05	1	3	1	2	2	2	█				█						█	█											
6	&	38	&	38	06	1	2	2	2	1	3	█			█								█	█										
7	apostrophe	39	apostrophe	39	07	1	2	2	3	1	2	█			█									█	█									
8	(	40	(	40	08	1	3	2	2	1	2	█				█						█	█										
9	)	41	)	41	09	2	2	1	2	1	3	█	█			█							█	█									
10	*	42	*	42	10	2	2	1	3	1	2	█	█			█								█	█									
11	+	43	+	43	11	2	3	1	2	1	2	█	█				█								█	█								
12	comma	44	comma	44	12	1	1	2	2	3	2	█			█	█								█	█									
13	-	45	-	45	13	1	2	2	1	3	2	█				█									█	█								
14	full stop	46	full stop	46	14	1	2	2	2	3	1	█														█	█							
15	/	47	/	47	15	1	1	3	2	2	2	█			█										█	█								

SYMBOL CHAR. VALUE	CODE SET A	ISO/IEC 646 VALUE for Set A	CODE SET B	ISO/IEC 646 VALUE for Set B	CODE SET C	ELEMENT WIDTHS (modules)						ELEMENT PATTERN																																							
						B	S	B	S	B	S	1	2	3	4	5	6	7	8	9	10	11																													
60	\	92	\	92	60	3	1	4	1	1	1																																								
61]]	93]]	93	61	2	2	1	4	1	1																																								
62	^	94	^	94	62	4	3	1	1	1	1																																								
63	_	95	_	95	63	1	1	1	2	2	4																																								
64	NUL	00	grave accent	96	64	1	1	1	4	2	2																																								
65	SOH	01	a	97	65	1	2	1	1	2	4																																								
66	STX	02	b	98	66	1	2	1	4	2	1																																								
67	ETX	03	c	99	67	1	4	1	1	2	2																																								
68	EOT	04	d	100	68	1	4	1	2	2	1																																								
69	ENQ	05	e	101	69	1	1	2	2	1	4																																								
70	ACK	06	f	102	70	1	1	2	4	1	2																																								
71	BEL	07	g	103	71	1	2	2	1	1	4																																								
72	BS	08	h	104	72	1	2	2	4	1	1																																								
73	HT	09	i	105	73	1	4	2	1	1	2																																								
74	LF	10	j	106	74	1	4	2	2	1	1																																								
75	VT	11	k	107	75	2	4	1	2	1	1																																								
76	FF	12	l	108	76	2	2	1	1	2	1																																								
77	CR	13	m	109	77	4	1	3	1	1	1																																								
78	SO	14	n	110	78	2	4	1	1	1	2																																								
79	SI	15	o	111	79	1	3	4	1	1	1																																								
80	DLE	16	p	112	80	1	1	1	2	4	2																																								
81	DC1	17	q	113	81	1	2	1	1	4	2																																								
82	DC2	18	r	114	82	1	2	1	2	4	1																																								
83	DC3	19	s	115	83	1	1	4	2	1	2																																								
84	DC4	20	t	116	84	1	2	4	1	1	2																																								
85	NAK	21	u	117	85	1	2	4	2	1	1																																								
86	SYN	22	v	118	86	4	1	1	2	1	2																																								
87	ETB	23	w	119	87	4	2	1	1	1	2																																								
88	CAN	24	x	120	88	4	2	1	2	1	1																																								
89	EM	25	y	121	89	2	1	2	1	4	1																																								
90	SUB	26	z	122	90	2	1	4	1	2	1																																								
91	ESC	27	{	123	91	4	1	2	1	2	1																																								
92	FS	28		124	92	1	1	1	1	4	3																																								
93	GS	29	}	125	93	1	1	1	3	4	1																																								
94	RS	30	~	126	94	1	3	1	1	4	1																																								
95	US	31	DEL	127	95	1	1	4	1	1	3																																								
96	FNC3		FNC3		96	1	1	4	3	1	1																																								
97	FNC2		FNC2		97	4	1	1	1	1	3																																								
98	SHIFT		SHIFT		98	4	1	1	3	1	1																																								
99	CODE C		CODE C		99	1	1	3	1	4	1																																								
100	CODE B		FNC4		CODE B	1	1	4	1	3	1																																								