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

*Technologies de l'information — Techniques d'identification automatique et
de capture des données — Spécifications pour les symboles des codes à
barres — Code 128*

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

Annexes A to C form a normative part of this International Standard. Annexes D to H are for information only.

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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.

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.

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

1 Scope

This International Standard defines the technical requirements for the bar code symbology known as Code 128. It specifies Code 128 symbology characteristics, data character encodation, dimensions, decoding algorithms and the application parameters which need to be defined by users. It specifies the Symbology Identifier prefix strings for Code 128 symbols.

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, *Information technology — ISO 7-bit coded character set for information interchange*.

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*.

ISO/IEC 10646-1, *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane*.

ISO/IEC 15424, *Information technology — Automatic identification and data capture techniques — Data carrier/symbology Identifiers*.

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

EN 1556, *Bar coding — Terminology*.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in EN 1556 apply.

4 Requirements

4.1 Symbology characteristics

The characteristics of Code 128 are:

- a) Encodable character set:

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- 1) All 128 ASCII characters, i.e. ASCII characters 0 to 127 inclusive, in accordance with ISO 646.
 - 2) Characters with ASCII 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.
- f) Bidirectionally decodable: Yes.
- g) Symbol check character: One, mandatory (see annex 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

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Code 128 symbols shall comprise:

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

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



Figure 1 — Code 128 symbol

4.3 Character assignments

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.

4.3.1 Symbol character structure

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.

Figure 2 below illustrates Start character A.

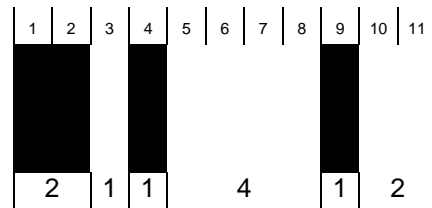


Figure 2 — Code 128 Start character A

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 — Symbol character value 35

Figure 4 below illustrates the Stop character.

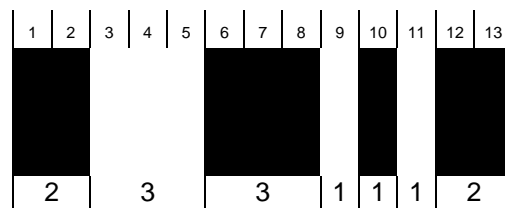


Figure 4 — Code 128 Stop character

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. The symbol character bar and space patterns shown represent the data characters listed under the columns for Code Set A, B, or C. The choice of code sets depends on the Start character or 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 4.3.4.2 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 other than that specified in annex E, such as a symbol with a code set character at the end of the data.

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 ASCII values (see annex D).

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