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Information technology — Automatic identification and data capture techniques — EAN/UPC bar code symbology specification

Technologies de l'information — Techniques automatiques d'identification et de capture des données — Spécification de symbologie de code à barres EAN/UPC

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Requirements ... **2**
4.1 Symbology characteristics ... 2
4.2 Symbol structure ... 2
4.2.1 Symbol types ... 2
4.2.2 Symbol encodation ... 2
4.2.3 Symbol formats ... 4
4.3 Dimensions and tolerances ... 12
4.3.1 Measurement basis ... 12
4.3.2 Width of narrow element (X) ... 12
4.3.3 Bar height ... 12
4.3.4 Quiet zone ... 12
4.3.5 Positioning of the add-on symbol ... 13
4.3.6 Element widths ... 13
4.3.7 Symbol width ... 13
4.3.8 Symbol size ... 14
4.3.9 Dimensional tolerances ... 14
4.4 Reference decode algorithm ... 14
4.5 Symbol quality ... 18
4.5.1 Test methodology ... 18
4.5.2 Decodability ... 19
4.5.3 Additional criteria ... 19
4.6 Application-defined parameters ... 20
4.7 Human-readable interpretation ... 20
4.8 Transmitted data ... 20
4.9 Implementation guidelines ... 20
Annex A (normative) **Additional features** ... **21**
Annex B (normative) **Symbology identifier** ... **23**
Annex C (informative) **Overview of the GS1 system** ... **24**
Annex D (informative) **Illustration of number sets A, B and C and auxiliary patterns** ... **25**
Annex E (informative) **Dimensioned drawings of the nominal size symbols** ... **28**
Annex F (informative) **Traditional dimensional tolerances** ... **33**
Annex G (informative) **Guidelines for reading and printing** ... **35**
Bibliography ... **37**

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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 15420:2009), which has been technically revised.

The main changes are as follows:

— terminology and dimensions have been updated to align with latest GS1 General Specifications;

— clarification on what is defined in this document compared to an application standard has been added;

— example barcodes have been revised to use GS1 company prefixes reserved for examples;

— verification lighting has been changed from 670 nm to 660 nm to align with GS1 General Specifications.

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.

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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. EAN/UPC 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.

This document is intended to be used alongside the GS1 General Specifications. The administration of the numbering system by GS1 ensures that identification codes assigned to particular items are unique worldwide and are defined in a consistent way. The major benefit for the users of the GS1 system[1)] is the availability of uniquely defined identification codes for use in their trading transactions. Annex C gives an overview of the GS1 system.

NOTE GS1 is the worldwide association encompassing the organizations formerly known as EAN International and Uniform Code Council (UCC).

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.

1) The GS1 system are specifications, standards, and guidelines administered by GS1.

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Information technology — Automatic identification and data capture techniques — EAN/UPC bar code symbology specification

1 Scope

This document specifies the requirements for the bar code symbology known as EAN/UPC. This document specifies EAN/UPC symbology characteristics, data character encodation, dimensions, tolerances, decoding algorithms and parameters to be defined by applications. It specifies the symbology identifier prefix strings for EAN/UPC symbols.

Data content and the rules governing the use of this symbology are outside the scope of this document; they are defined in GS1 General Specifications.

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

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

ISO/IEC 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Vocabulary*

GS1 General Specifications (GS1, Brussels, Belgium)[2)]

3 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
auxiliary pattern
pattern of bars and spaces representing non-data components of the symbol

EXAMPLE Guard patterns and inter-character delineators.

3.2
GTIN
Global Trade Item Number
GS1 identification key that is used for the unique identification of trade items worldwide and which may be 8, 12, 13 or 14 digits in length

2) Available at www.gs1.org.

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3.3
number set
series of ten bar and space patterns of either even or odd parity encoding the digits 0 to 9

4 Requirements

4.1 Symbology characteristics

The characteristics of EAN/UPC are:

a) encodable character set: numeric (0 to 9) i.e. ASCII characters 48 to 57 inclusive, according to ISO/IEC 646;

b) symbology type: continuous;

c) elements per symbol character: 4, comprising 2 bars and 2 spaces, each of 1, 2, 3 or 4 modules in width (auxiliary patterns have differing numbers of elements);

d) character self-checking: yes;

e) data string length encodable: fixed (8, 12 or 13 characters including check digit depending on specific symbol type);

f) omni-directionally decodable: yes;

g) symbol check digit: one, mandatory (see Clause A.1);

h) symbol character density: 7 modules per symbol character;

i) non-data overhead not including the check digit or quiet zones:

— 11 modules for EAN-13, EAN-8 and UPC-A symbols;

— 9 modules for UPC-E symbols.

4.2 Symbol structure

4.2.1 Symbol types

There are four types of the EAN/UPC symbol:

— EAN-13, UPC-A and UPC-E, all of which may be accompanied by an add-on symbol;

— EAN-8.

The four symbol types are described in 4.2.3.1 to 4.2.3.4 and the optional add-on symbols are described in 4.2.3.5.

4.2.2 Symbol encodation

4.2.2.1 Symbol characters

Symbol characters shall encode digit values in 7-module characters selected from different number sets known as A, B and C, as in Table 1.

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