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Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specification —

Part 2: Two-dimensional symbols

Technologies de l'information — Techniques automatiques d'identification et de capture des données — Spécifications de conformité des vérificateurs de codes à barres —

Partie 2: Symboles bidimensionnels

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Conformance ... **1**
3 Normative references ... **1**
4 Terms and definitions ... **2**
5 Symbols ... **2**
6 Functional requirements ... **2**
6.1 General requirements ... 2
6.2 Reflectance calibration ... 2
6.3 Mandatory functions ... 3
6.3.1 Verifiers for multi-row bar code symbols ... 3
6.3.2 Verifiers for two-dimensional matrix symbols ... 3
6.4 Optional functions ... 3
7 General constructional and operational requirements ... **4**
7.1 Installation, operation and maintenance ... 4
7.2 Power supply ... 4
7.3 Temperature ... 4
7.3.1 Operating temperature range ... 4
7.3.2 Storage temperature range ... 4
7.4 Humidity ... 4
7.5 Ambient light immunity ... 4
8 Test requirements ... **4**
8.1 Test methods ... 4
8.1.1 Selection of equipment for testing ... 5
8.1.2 Scanning parameters ... 5
8.1.3 Test measurements ... 5
8.2 Test environment ... 5
8.3 Primary reference test symbols ... 5
8.4 Test report ... 6
9 Certification and labelling ... **6**
10 Equipment specification ... **6**
Annex A (normative) **Primary reference test symbols** ... **8**
Annex B (normative) **Verification requirements for primary reference test symbols** ... **13**
Bibliography ... **14**

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is 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 15426-2:2005), which has been technically revised. It also incorporates the Technical Corrigendum ISO/IEC 15426-2:2005/Cor1:2008.

ISO/IEC 15426 consists of the following parts, under the general title *Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specification*:

— *Part 1: Linear symbols*

— *Part 2: Two-dimensional symbols*

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Introduction

The technology of bar coding is based on the recognition of patterns encoded, in bars and spaces or in a matrix of modules of defined dimensions, according to rules defining the translation of characters into such patterns, known as the symbology specification. Symbology specifications may be categorised into linear symbols, on the one hand, and two-dimensional symbols on the other; the latter may in turn be sub-divided into «multi-row bar codes» sometimes referred to as “stacked bar codes”, and “two-dimensional matrix codes”.

Multi-row bar codes are constructed graphically as a series of rows of symbol characters, representing data and overhead components, placed in a defined vertical arrangement to form a (normally) rectangular symbol, which contains a single data message. Each row of the symbol has the characteristics of a linear bar code symbol and may be read by linear symbol scanning techniques.

Two-dimensional matrix symbols are usually rectangular arrangements of modules placed at the intersections of a grid of two (sometimes more) axes; the coordinates of each module need to be known in order to determine its significance, and the symbol must therefore be analysed two-dimensionally before it can be decoded.

Unless the context requires otherwise, the term “symbol” in this International Standard may refer to either type of symbology.

The symbol, as a machine-readable data carrier, must be produced in such a way as to be reliably decoded at the point of use, if it is to fulfil its basic objective. Standard methodologies have been developed for measuring and assessing the quality of symbols for process control and quality assurance purposes during symbol production as well as afterwards.

Manufacturers of bar code equipment, the producers of bar code symbols and the users of bar code technology require publicly available standard conformance specifications for measuring equipment applying these methodologies, to ensure the accuracy and consistency of performance of this equipment.

This International Standard is intended to be similar in technical content (mutatis mutandis) to ISO/IEC 15426-1 (the linear bar code verifier conformance standard), on which it has been based. It is intended to be read in conjunction with the symbology specification applicable to the bar code symbol being tested, which provides symbology-specific detail necessary for its application.

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Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specification —

Part 2: Two-dimensional symbols

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1 Scope

This part of ISO/IEC 15426 defines test methods and minimum accuracy criteria applicable to verifiers using the methodologies of ISO/IEC 15415 for multi-row bar code symbols and two-dimensional matrix symbologies, and specifies reference calibration standards against which these should be tested. This part of ISO/IEC 15426 provides for testing of representative samples of the equipment.

NOTE ISO/IEC 15426-1 applies to verifiers for linear bar code symbols.

2 Conformance

The instrument shall be considered to conform with this part of ISO/IEC 15426 if it performs the functions defined in 6.3 and if the results of measurements of primary reference test symbols carried out in accordance with Clause 8 demonstrate that the arithmetic means of the 10 measurements (for multi-row bar code symbols) or five measurements (for two-dimensional matrix symbols) of individual reported parameters are within the tolerances shown in Table 1 below.

Table 1 — Tolerances for measured parameter values

Parameter	Symbology type	Tolerance
R_{max} and/or R_s	Both	±5 % reflectance
R_{min} and/or R_b	Both	±3 % reflectance
UEC	Both	±0,0
Decodability	Multi-row	±0,08
Defects	Multi-row	±0,08
Codeword Yield	Multi-row	±0,08
Grid Nonuniformity	Matrix	±0,06
Axial Nonuniformity	Matrix	±0,02
Contrast Uniformity (Modulation)	Matrix	±0,08 of the MOD value described in A.3.2
Fixed Pattern Damage	Matrix	Within calibrated grade boundaries

NOTE The tolerances in Table 1 are additional to any tolerances stated by the supplier of the primary reference test symbols.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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ISO/IEC 15415, *Information technology — Automatic identification and data capture techniques — Bar code symbol print quality test specification — Two-dimensional symbols*

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

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)*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 15415, ISO/IEC 19762-1, ISO/IEC 19762-2 and the following apply.

4.1
primary reference test symbol
bar code symbol intended for the testing of the accuracy of bar code verifiers and manufactured to close tolerances, of at least ten times the precision listed in Table 1, by methods traceable to national standards

5 Symbols

R_b	Bar Reflectance, as defined in ISO/IEC 15416
R_{max}	Maximum reflectance, as defined in ISO/IEC 15416
R_{min}	Minimum reflectance, as defined in ISO/IEC 15416
R_s	Space Reflectance, as defined in ISO/IEC 15416

6 Functional requirements

6.1 General requirements

The general requirement of a two-dimensional symbol verifier is that it shall provide assessments of the quality of a bar code symbol which are accurate and consistent, both in relation to measurements of a specific symbol made with the same instrument over a period of time and in relation to measurements of a specific symbol made by different instruments. Such consistency is essential to enable valid comparisons to be made of assessments of a symbol verified at two different times or on two different instruments.

6.2 Reflectance calibration

Verifiers shall have means of calibration and adjustment where necessary of reflectance values against reference reflectance calibration samples. Two calibration points should be used, one as near the high reflectance end of the range and the other as near the low reflectance end of the range as possible.

ISO/IEC 15415 defines the reference reflectance material against which these samples shall be calibrated.

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