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Information technology — Automatic identification and data capture techniques — Rectangular Micro QR Code (rMQR) bar code symbology specification

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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Introduction

Rectangular Micro QR Code (rMQR) is a matrix symbology. The symbol consists of an array of nominally square modules, arranged in a rectangular pattern. Included is a unique finder pattern located at a single corner which is intended to assist in easy location of the symbols position, size, and inclination. A wide range of sizes of symbol is provided for, together with two levels of error correction. Module dimensions are user-specified to enable symbol production by a wide variety of techniques.

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Information technology — Automatic identification and data capture techniques — Rectangular Micro QR Code (rMQR) bar code symbology specification

1 Scope

This document defines the requirements for the symbology known as rMQR. It specifies the rMQR symbology characteristics, data character encoding methods, symbol formats, dimensional characteristics, error correction rules, reference decoding algorithm, printing quality requirements and user-selectable application parameters.

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 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

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

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

3 Terms and definitions

For the purpose 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
character count indicator
bit sequence which defines the data string length in a *mode* (3.6)

3.2
encoding region
region of the symbol not occupied by *function patterns* (3.4) and available for encoding of data and error correction codewords, and for *format information* (3.3)

3.3
format information
encoded pattern containing information on the error correction level and *version* (3.15) applied to symbol characteristics

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3.4
function pattern
overhead component of the symbol [finder pattern, *separator* (3.12), *timing patterns* (3.14), alignment patterns, finder sub patterns and corner finder pattern] required for location of the symbol or identification of its characteristics to assist in decoding

3.5
masking
process of XORing the bit pattern in an area of the symbol with a mask pattern to equalize the number of light and dark modules

3.6
mode
method of representing a defined character set as a bit string

3.7
mode indicator
identifier indicating in which *mode* (3.6) the following data sequence is encoded

3.8
padding bit
zero bit, not representing data, used to fill empty positions of the final codeword during the encoding process

3.9
remainder bit
zero bit, not representing data, used to fill empty positions of the symbol *encoding region* (3.2) after the final symbol character, where the area of the *encoding region* (3.2) does not divide exactly into 8-bit symbol characters

3.10
remainder codeword
codeword, placed after the data codeword stream that was generated in data encoding process, used to fill empty codeword positions to meet the requirements of number of data codeword of the *version* (3.15) and error correction definitions

3.11
segment
sequence of data encoded according to the rules of one ECI or encoding mode

3.12
separator
function pattern (3.4) of all light modules, one module wide, used to separate the finder pattern from the rest of the symbol

3.13
terminator
bit pattern of defined number (depending on symbol) of all zero bits used to end the bit string representing data

3.14
timing pattern
alternating sequence of dark and light modules enabling module coordinates in the symbol to be determined

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3.15
version
size of the symbol represented in terms of the number of modules in the vertical and horizontal axes, indicated, for example, as R7x59

Note 1 to entry: The error correction level applied to the symbol can be suffixed to the Version Indicator, e.g., Version R11x27-M.

3.16
version Indicator
five-bit identifier indicating symbol version used for a part of the *format information* (3.3)

3.17
error correction level indicator
one-bit identifier indicating error correction level used for a part of the *format information* (3.3)

4 Mathematical and logical symbols, abbreviated terms and conventions

4.1 Mathematical and logical symbols

DIV is the integer division operator

MOD is the integer remainder after division

XOR is the exclusive-or logic function whose output is one only when its two inputs are not equivalent. It is represented by the symbol $\oplus$.

4.2 Abbreviated terms

BCH Bose-Chaudhuri-Hocquenghem

ECI Extended Channel Interpretation

RS Reed-Solomon

4.3 Conventions

4.3.1 Module positions

For ease of reference, module positions are defined by their row and column coordinates in the symbol, in the form (*i, j*) where *i* designates the row (counting from the top downwards) and *j* the column (counting from left to right) in which the module is located, with counting commencing at 0. Module (0, 0) is therefore located at the upper left corner of the symbol.

4.3.2 Byte notation

Byte contents are shown as hexadecimal (hex) values.

4.3.3 Version references

Symbol versions are referred to in the form Version RC_VxC_H-E where C_V identifies the vertical number of modules (7, 9, 11, 13, 15, 17), C_H identifies the horizontal number of modules (27, 43, 59, 77, 99, 139), and E indicates the error correction level (M and H). For example, R13x27-M indicates a rectangular symbol that has 13 vertical modules, 27 horizontal modules, and an error correction level M. Versions may be referred to without error correction level. For example, R13x27.

NOTE For M and H, see 6.1 e).

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