ISO/IEC 16023:2000-05 (E)

Information technology - International symbology specification - MaxiCode

Contents

Page

Introduction 1

1 Scope 1

2 Normative References 1

3 Definitions and Mathematical Symbols 1
3.1 Definitions 1
3.1.1 Codeword 1
3.1.2 Extended Channel Interpretation (ECI) 1
3.1.3 Mode Indicator 1
3.1.4 Module 2
3.2 Mathematical Symbols and Operations 2

4 Requirements 2
4.1 SymbologyCharacteristics 2
4.1.1 Basic Characteristics 2
4.1.2 Summary of Additional Features 3
4.2 Symbol Description 4
4.2.1 Symbol Structure 4
4.2.2 Symbol Character and Module Sequence 5
4.3 General Encodation Procedures 6
4.4 CharacterAssignments 7
4.4.1 Codeword Representation 7
4.4.2 Default Character Interpretation 7
4.4.3 Code Sets 7
4.4.4 Symbology Control Characters 8
4.5 User Considerations for Encoding Data in a MaxiCode Symbol 9
4.5.1 User Selection of Error Correction Level 9
4.5.2 User Selection of Mode 9
4.5.3 User Selection of Extended Channel Interpretation 10
4.5.4 User Selection of Structured Append 10
4.5.5 User Assessment of Encodation Capacity 10
4.6 Extended Channel Interpretation 10
4.6.1 ECI and Modes 2 and 3 10
4.6.2 Encodation Modes and ECIs 10
4.6.3 Encoding ECIs in MaxiCode 11
4.6.4 ECIs and Structured Append 11
4.6.5 Post-Decode Protocol 11
4.7 Message Structure 11
4.7.1 Primary Message 11
4.7.2 Secondary Message 11
4.7.3 Structuring the Data 12
4.8 Modes 12
4.8.1 Mode 0: Obsolete 12
4.8.2 Mode 1: Obsolete 12
4.8.3 Modes 2 and 3: Structured Carrier Message 12
4.8.4 Mode 4: Standard Symbol 13
4.8.5 Mode 5: Full EEC 13
4.8.6 Mode 6: Reader Programming 13
4.8.7 Mode Indicators 13
4.9 Structured Append 13

4.9.1 Basic Principles 13
4.9.2 Structured Append and Modes 2 and 3 13
4.9.3 Structured Append in Modes 4 to 6 14
4.9.4 Buffered and Unbuffered Operation 14
4.10 Error Detection and Correction 14
4.10.1 Enhanced Error Correction (EEC) in the Primary Message 14
4.10.2 Error Correction in the Secondary Message 14
4.10.3 Generating the Error Correction Codewords 14
4.10.4 Error Correction Capacity 15
4.11 Dimensions 15
4.11.1 Symbol Dimensions 15
4.11.2 Hexagonal Module Dimensions 15
4.11.3 Dark Hexagon Dimensions and Tolerances 16
4.11.4 Finder Pattern Dimensions 16
4.11.5 Quiet Zones 17
4.11.6 Overall Symbol Size 17
4.11.7 Practical Printing Guidance 17
4.12 User Guidelines 17
4.12.1 Human Readable Interpretation 17
4.12.2 AutodiscriminationCapability 17
4.13 Symbol Quality 17
4.13.1 Obtaining the Test Image 17
4.13.2 Symbol Quality Parameters 17
4.13.3 Overall Symbol Grade 19
4.13.4 Process Control Measurements 19
4.14 Reference Decode Algorithm 19
4.15 Transmitted Data 22
4.15.1 Basic Interpretation 22
4.15.2 Protocol for Extended Channel Interpretation 22
4.15.3 Symbology Identifier 22
4.15.4 Transmitted Data Example 23

Annexe A (Normative) 24

MaxiCode Basic Character Encodation: Default Character Set 24

Annexe B (Normative) 26

Mode 2 and Mode 3: Structured Carrier Message 26

B.1 The Structure of the Primary Message 26
B.2 Modes 2 and 3 Messages Beginning with "[)>RS01GS" 27
B.2.1 Encoding 27
B.2.2 Decoding 27
B.3 Modes 2 and 3 Messages Not Beginning with "[)>RS01GS" 28
B.3.1 Encoding 28
B.3.2 Decoding 28
B.4 Modes 2 and 3 and Structured Append 28
B.4.1 Encoding Considerations 28
B.4.2 Decoding Considerations 28

Annexe C (Normative) 29

2D Matrix Bar Code Print Quality - Guideline 29

C.1 Obtaining the Test Image 29
C.2 Assessing Symbol Parameters 29
C.2.1 Decode 29
C.2.2 Symbol Contrast 30
C.2.3 "Print" Growth 30
C.2.4 Grid Nonuniformity 30
C.2.5 Unused Error Correction 31

C.3 Overall Symbol Grade 31

Annexe D (Normative) 31

Error Correction Algorithm 31

Annexe E (Normative) 32

Symbology Identifiers 32

Annexe F (Informative) 32

Use of Numeric Shift, Shift , Latch, and Lock-In Characters 32

F.1 Numeric Shift 32
F.2 Switching from Code Set A to Code Set B 33
F.3 Switching from Code Set B to Code Set A 33
F.4 Using Lock-In to Latch to Code Sets C, D or E 33
F.5 Illustrative Example 33

Annexe G (Informative) 34

User Assessment of Encodation Capacity 34

Annexe H (Informative) 35

A MaxiCode Encoding Example 35

Annexe J (Informative) 38

Practical Printing Considerations 38

J.1 12 dots per Millimeter 38
J.2 8 dots per Millimeter 39
J.3 Generic Rules for Other Pixel Sizes 40
J.4 Determining the Hexagon Font for a Given Dot Pitch 40

Annexe K (Informative) 41

AutodiscriminationCompatibility 41

Annexe L (Informative) 42

Useful Process Control Techniques 42

L.1 Symbol Contrast 42
L.2 Symbol Size 42
L.2.1 Checking Print Growth 42
L.2.2 Checking Finder Position and Orientation Patterns 42
L.2.3 Checking Overall Symbol Size 42
L.3 Symbol Distortion 43
L.4 Print Growth and Defects 43