

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 Symbology Characteristics | 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 Character Assignments | 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 | Autodiscrimination Capability | 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 |