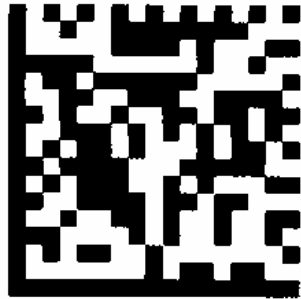


Bar Codes 101

Introduction to Data Matrix



Symbology profile

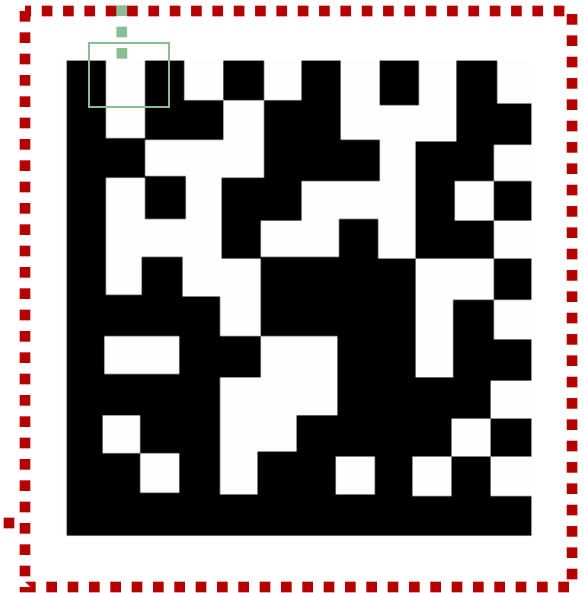


- Introduced in 1995
- AIM standard released in 1996

- Quiet zone required around perimeter
- The border is composed of 2 sides forming an “L” pattern and 2 sides alternating light and dark elements
- The border is known as the finder pattern and used for determining size, orientation, and symbol distortion
- Symbol sizes range from 10x10 to 144x144
- Maximum size capacity: 2,335 alphanumeric, 3116 numerical, or 1556 bytes

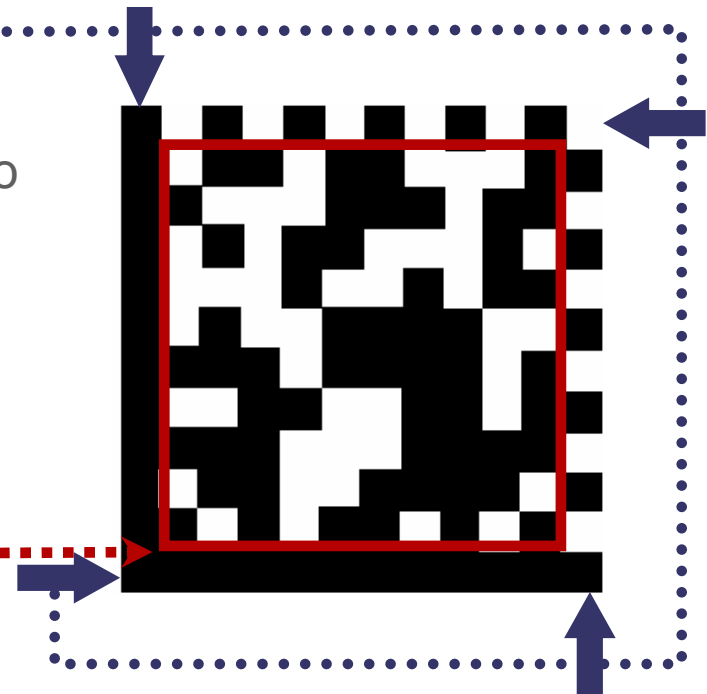
Symbol structure

- Element (module) 
 - Square shaped cell that encodes one bit of binary data
 - = Binary "0"
 - = Binary "1"
 - Consistent size throughout code
 - Dependent on finder pattern color
- Quiet zone 
 - AIM specification calls for a minimum of one element width (1x) on each side of the symbol



Symbol structure continued

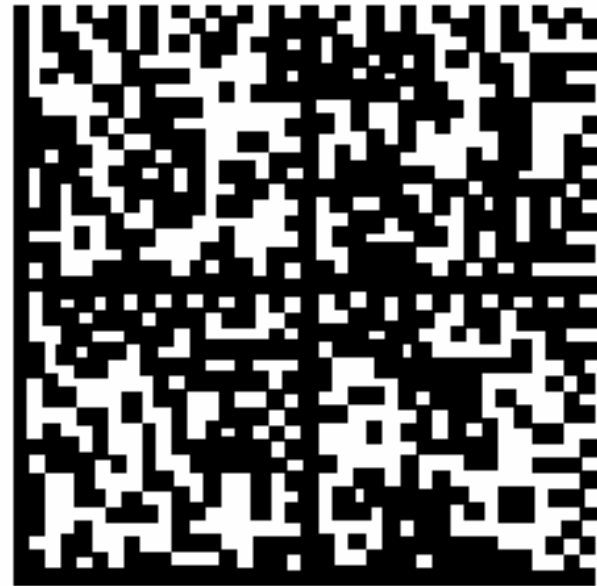
- Structure Finder Pattern
 - The outermost rows and columns
 - Composed of two solid lines and two alternating dark/light lines
 - Used to define physical size, orientation, distortion and the number of rows and columns
- Data Region
 - The area inside the finder pattern
 - Contains data and error correction code words



Symbol data regions

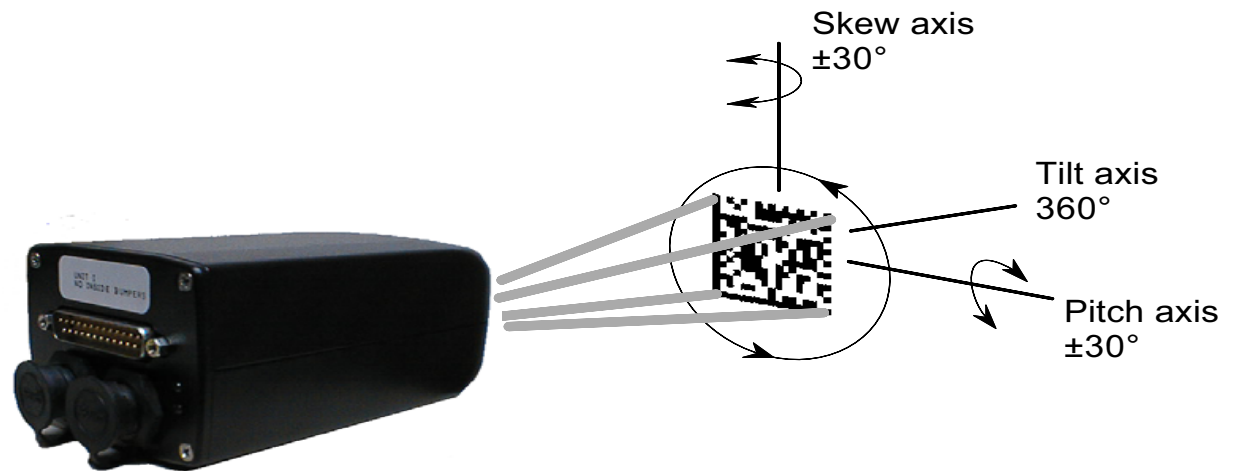
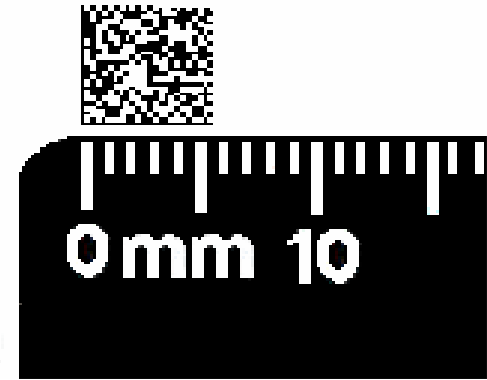
- Symbol can have multiple data regions
 - Maximum capacity for a single data region
 - 88 numeric
 - 64 alpha/numeric
- Symbol shape can be square or rectangular
 - Rectangular shape applicable only to ECC 200

.....
↓ "Alignment pattern" separates regions



Additional features

- Symbol density
 - Encodes 50 characters in 6mm x 6mm square
- Symbol versatility
 - Readable in 360° with 2D CCD technology



Advantages and disadvantages

Advantages

- **Small size**
- **No orientation requirements**
- **Easy to print**
- **Built-in error correction makes it very secure and robust**

Disadvantages

- **Expensive hardware**
- **Slower to process**



More information

- If you have questions regarding this topic, send us an e-mail to training@microscan.com
- If you would like further information about bar code symbologies, we recommend you view [Intro to PDF417](#) or [Intro to Linear Bar Codes](#)