

VeriSens® – Code Reading

AN201410/v0.2/2023-08-21

Description

In this document we will give answers to questions that are asked very often regarding the reading possibilities of barcodes and matrix codes.

Products

VeriSens® Vision Sensors

Preparation

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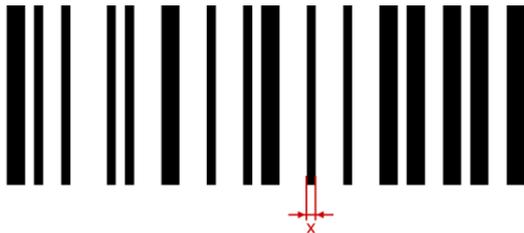
1 Barcode Reading FAQs

1.1 Which barcode types can be read by VeriSens®?

- 2/5 Industrial,
- 2/5 Interleaved,
- Codabar,
- Code 39,
- Code 93,
- Code 128,
- PharmaCode,
- EAN 8, EAN 13, UPC-A, UPC-E: Basiscode + Varianten Add-On 2, Add-On 5
- GS1 DataBar (RSS): Limited, Expanded, Expanded Stacked,
- GS1 DataBar (RSS-14): Basiscode + Varianten Truncated, Stacked, Stacked Omnidir,
- GS1 128

1.2 What do you have to keep in mind while using the feature “Barcode”?

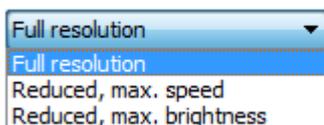
One bar or gap of the code has to be at least 1.5 px thick in the image.



1.3 How can I speed up the inspection?

- Reduce resolution („1. Adjust image“)

Resolution:



- Optimize on teach

Parameters Optimize on teach

1.4 What do I have to understand by code quality?

Standards regarding code quality have initially been developed to secure that a barcode on the product packaging can be read stably by a supermarket scanner. The supermarket defines the code quality that can be read stably and fast at the till scanner. The suppliers of these products have to make sure that their imprints fulfill this quality.

By this time, code quality is not only used in retailing, but also in industrial sectors. In order to determine the code quality exactly, further standards have been developed. These standards precisely define the conditions in which the code has to be taken (illumination, optics, etc.) and the code quality has to be calculated.

To determine the quality of a code, special devices have been developed, so called “Code verifier”. These devices can give a definite statement on the absolute quality of the code. *VeriSens*® is not a code verifier! *VeriSens*® calculates the quality of a code as specified in the standards, but the environmental conditions, set in the standard mostly do not lie within the standard specifications. Therefore it is not possible to get a legally binding statement regarding the code quality by using *VeriSens*®. However, *VeriSens*® can be used to **detect variations** (usually deteriorations are of interest) in the code quality.

2 Matrix Code

2.1 Which advantages do matrix codes have compared to barcodes?

Matrix codes have a lot of advantages compared to barcodes:

- Higher concentration of usable information per area
- Opportunity of error correction via implemented redundancy (even if parts of the code are damaged the code can be read correctly)
- Opportunity of direct marking (e.g. needles in metal)
- Lower requirements for print quality to be read stably

2.2 Which code types can be read by *VeriSens*®?

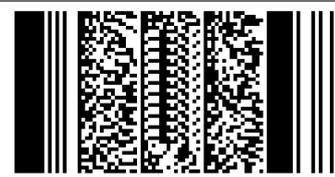
DataMatrix (ECC 200), GS1-DataMatrix, QR-Code, PDF417



DataMatrix (ECC 200)



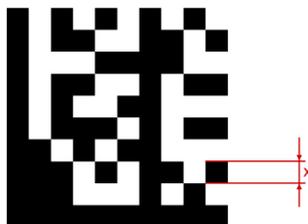
QR-Code



PDF417

2.3 What do I have to keep in mind while using the matrix code feature?

The **minimal thickness of a module** has to be at **least 3-4px** in the image. If the modules are smaller in the image, the code cannot be read reliably.



Module size

Please note that the so called “clearzone” (free space around the code) is an important part of a matrix code. If the **region of interest is chosen too small**, the code cannot be found stably anymore.



Region of interest too small



Region of interest big enough

The boundary of the matrix code so called “finder pattern” shows the orientation and size of the code. Are the “finder pattern” or the “clear zone” damaged, maybe, the code cannot be found stably anymore.



In the case of poor print or image quality or if a directly marked code has to be read, it might be necessary to set the parameter to “robust” or “maximum”.

| | | |
|------------|---|---|
| Code type | <input type="text" value="Data Matrix (ECC200)"/> | <input checked="" type="checkbox"/> Detect on teach |
| Parameters | <input type="text" value="User defined"/> | <input checked="" type="checkbox"/> Optimize on teach |
| Quality | <input type="text" value="Fast"/> <input type="text" value="Robust"/> <input type="text" value="Maximum"/> <input type="text" value="User defined"/> | <input type="text" value="Not calculated"/> <input type="text" value="D"/> |

2.4 How can I speed up the inspection?

- Reduce resolution (Adjust image)

Resolution:

| |
|--|
| <input type="text" value="Full resolution"/> |
| <input type="text" value="Full resolution"/> |
| <input type="text" value="Reduced, max. speed"/> |

- Optimize on teaching

| | | |
|------------|---|---|
| Parameters | <input type="text" value="User defined"/> | <input checked="" type="checkbox"/> Optimize on teach |
|------------|---|---|

2.5 Can directly marked codes also be read?

Yes, in the most cases, especially matrix codes can be read without complications. Owing to the principles applied, a higher effort might be necessary for barcodes. An additional illumination may be necessary to make the marking more visible. (Mostly dark field illumination or coaxial illumination)

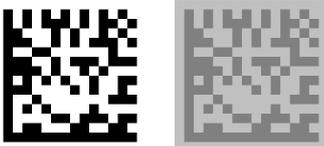
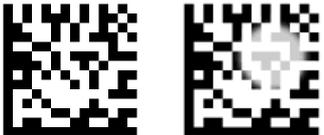
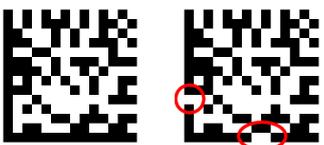
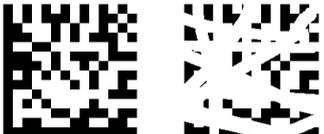
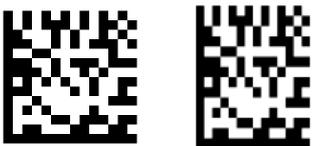
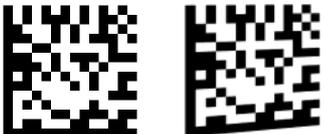
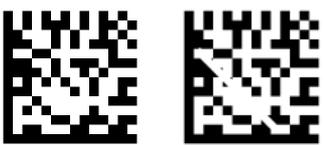
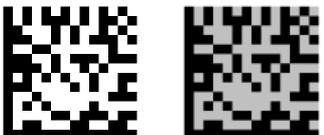
2.6 What do we understand by code quality?

Quality
 Minimum quality

F (AAAAFAAD)

The code quality consists of two parts. The **total quality** and the **single quality features**. The total quality is equal to the worst quality feature.

Quality features of DataMatrix (ECC200) and QR Code (ISO/IEC 15415 + AIM DPM-1-2006)

| Feature | Example | Description |
|------------------------------|---|---|
| Contrast |  | Gap between minimum and maximum grey value of the module |
| Modulation |  | Amplitude between data code modules (depended on error correction!) |
| Frame pattern |  | Disturbance of frame pattern (Finder pattern) |
| Readability |  | A = Code readable F = Code not readable |
| Axial non-constancy |  | Evaluation of width and high of the modules |
| Pattern non-constancy |  | Evaluation of inclination angle (distortion in perspective) |
| Unused error correction |  | Rate of unused error redundancy |
| Grey value of bright modules |  | Middle grey value of all bright modules of the DataMatrix- or QR-Code |

3 Support

In the case of any questions or for troubleshooting please contact our support team.

Worldwide

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