INTERNATIONAL STANDARD ISO/IEC 16022:2006
TECHNICAL CORRIGENDUM 2

Published 2011-02-01

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION
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Information technology — Automatic identification and data capture techniques — Data Matrix bar code symbology specification

TECHNICAL CORRIGENDUM 2

Technologies de l'information — Techniques automatiques d'identification et de capture des données — Spécification de symbologie de code à barres Data Matrix

RECTIFICATIF TECHNIQUE 2

Technical Corrigendum 2 to ISO/IEC 16022:2006 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

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Replace Clause 9 with the following:

9 Reference decode algorithm for Data Matrix

This reference decode algorithm finds a Data Matrix symbol in an image and decodes it.

a) Define measurement parameters and form a digitised image:

   1) Define a distance d_{min} which is 7,5 times the aperture diameter defined by the application. This will be the minimum length of the "L" pattern's side.

ICS 01.080.50; 35.040 **Ref. No. ISO/IEC 16022:2006/Cor.2:2011(E)**

Published in Switzerland

2) Define a distance g_{max} which is 7,5 times the aperture diameter. This is the largest gap in the "L" finder that will be tolerated by the finder algorithm in step b).

3) Define a distance m_{min} which is 1,25 times the aperture diameter. This would be the nominal minimum module size when the aperture size is 80% of the symbol's *X* dimension.

4) Form a black/white image using a threshold determined according to the method defined in ISO/IEC 15415.

b) Search horizontal and vertical scan lines for the two outside edges of the Data Matrix "L":

1) Extend a scan line horizontally in both directions from the centre point of the image. Sample along the scan line. For each white/black or black/white transition found along the scan line resolved to the pixel boundary:

i) Follow the edge upward sampling pixel by pixel until either it reaches a point $3{,}5m_{min}$ distant from the intersection of the scan line and the edge starting point, or the edge turns back toward the intersection of the scan line and the edge - the starting point.

ii) Follow the edge downward pixel by pixel until either it reaches a point $3{,}5m_{min}$ distant from the intersection of the scan line and the edge starting point, or the edge turns back toward the intersection of the scan line and the edge - the starting point.

iii) If the upward edge reaches a point $3{,}5m_{min}$ from the starting point:

I) Plot a line A connecting the end points of the upward edge.

II) Test whether the intermediate edge points lie within $0{,}5m_{min}$ from line A. If so, continue to step III. Otherwise proceed to step 1)iv) to follow the edge in the opposite direction.

III) Continue following the edge upward until the edge departs $0{,}5m_{min}$ from line A. Back up to the closest edge point greater than or equal to m_{min} from the last edge point along the edge before the departing point and save this as the edge end point. This edge point should be along the "L" candidate outside edge.

IV) Continue following the edge downward until the edge departs $0{,}5m_{min}$ from line A. Back up to the closest edge point greater than or equal to m_{min} from the last edge point along the edge before the departing point and save this as the edge end point. This edge point should be along the "L" candidate outside edge.

V) Calculate a new adjusted line A1 that is a "best fit" line to the edge in the two previous steps. The "best fit" line uses the linear regression algorithm (using the end points to select the proper dependent axis, i.e. if closer to horizontal, the dependent axis is x) applied to each point. The "best fit" line terminates lines at points p1 and p2 that are the points on the "best fit" line closest to the endpoints of the edge.

VI) Save the line A1 segment two end points, p1 and p2. Also save the colour of the left side of the edge viewed from p1 to p2.

iv) If step iii) failed or did not extend upward by $3{,}5m_{min}$ in step iii)IV), test if the downward edge reaches a point $3{,}5m_{min}$ from the starting point. If so, repeat the steps in iii) but with the downward edge.

v) If neither steps iii) or iv) were successful, test if both the upward and downward edges terminated at least $2m_{min}$ from the starting point. If so, form an edge comprised of the appended $2m_{min}$ length upward and downward edge segments and repeat the steps in iii) but with the appended edge.

vi) Proceed to and process the next transitions on the scan line, repeating from step i), until the boundary of the image is reached.