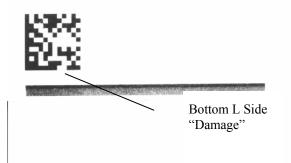# The Datamatrix Report

Webscan TruCheck

Sun 09-Feb-2003 08:27AM

Symbology: Datamatrix
Data: test

Overall Grade: D

Matrix Size: 10X10
Horizon BWG: 3%
Verical BWG: 5%
Error Correction Budget: 5
Errors Corrected: 2
Image is Black on white

1.UEC:	20%	F	Fail
2.SC:	139%	A	Pass
3.MOD:	4.0	A	Pass
4.ANU:	0%	A	Pass
5.GNU:	4%	A	Pass
6.LLS:	4.0	A	Pass
7.BLS:	1.0	D	Fail
8.LQZ:	4.0	A	Pass
9.BQZ:	4.0	A	Pass
10.TQZ:	4.0	A	Pass
11.RQZ:	4.0	A	Pass
12.TTR:	8%	B	Pass
13.RTR:	0%	A	Pass
14.TCT:	4.0	A	Pass
15.RCT:	4.0	A	Pass

Bottom L Side
"Damage"

Datamatrix Parameters:

1. UEC
   Unused Error Correction
   This is the percentage of error correction capability that is available for further incorrect modules. The assignment of grade is according to the following table:

UEC %	Grade
>62	A
>50 (but less than 62)	B
>37 (but less than 50)	C
>25 (but less than 37)	D
<25	F

2. SC
   Symbol Contrast
   This is the difference in reflectivity between the brightest module and the darkest module. The assignment of grade is according to the following table:

SC %	Grade
>70	A
>55 (but less than 70)	B
>40 (but less than 55)	C
>20 (but less than 40)	D
<20	F

3. MOD:
   Modulation
   This is a grade based on the amount of variability in reflectivity of the modules. A multi-step process is used to get the modulation grade.

   First the reflectivity of each module is compared to the global threshold and the overall Symbol Contrast according to the following formula:
   $$MOD = 2 * (abs(R-GT))/SC$$
   The Global Threshold GT is the midpoint between the reflectance of the brightest module and the reflectance of the darkest module.
   Next, the grade level *for each module* is determined from the MOD value according to the following table:

MOD %	Grade
>50	A
>40 (but less than 60)	B
>30 (but less than 50)	C
>20 (but less than 50)	D
<20	F

   Finally, the value of the grade for the MOD parameter will be the highest modulation level for which the modules meeting that level will result in an Unused Error Correction grade of that level or higher.

4. ANU:
    Axial Non-uniformity
    >   This is the amount of "out of square" a symbol is, or in other words a measure of the overall aspect ratio of the symbol.

5. GNU
    Grid Non-uniformity
    >   This is the worst case distance between the calculated center of a module and the ideal location for the center of the module based on perfectly evenly spaced modules. The calculated center of the module is determined using the clock tracks. The value is reported as a fraction of a module size.

6. LLS
    Left 'L' Side
    >   This is a grade based on imperfections in the left 'L' side of the finder pattern. There are two checks required to pass. The first requires gaps to be three modules are less and that gaps are separated by stretches of at least four correct modules. The second assigns a grade based on the overall percentage of correct modules according to the following table:

% of incorrect modules	Grade
0	A
<9 (but less than)	B
<13 (but less than)	C
<17 (but less than)	D
>17	F

    >   The grade is the highest modulation level in which the first (gap test) passes and the correct module percentage results in a grade of that level or higher.

7. BLS
    Bottom 'L' Side
    >   This is a grade based on imperfections in the bottom 'L' side of the finder pattern (see Left 'L' Side).

8. LQZ
    Left Quiet Zone
    >   This is a grade based on imperfections in the quiet zone which is a one module area to the left of the left 'L' side. The grade is based on the percentage of modules which are correct using the same grading table as for the 'L' sides.

9. BQZ
    Bottom Quiet Zone
    >   This is a grade based on imperfections in the quiet zone which is a one module area below the bottom 'L' side.

10. TQZ
    Top Quiet Zone
    >   This is a grade based on imperfections in the quiet zone which is a one module area above the top clock track.

11. RQZ
    Right Quiet Zone
    >   This is a grade based on imperfections in the quiet zone which is a one module area to the right of the Right Clock Track.

12. TTR
    Top Transition Ratio
        This is a grade based on imperfections in the top clock track, with relation to its adjoining quiet zone. The ratio is the number of transitions, from light to dark or dark to light, in the quiet zone divided by the number of transitions in the clock track. Since the number of transitions in the quiet zone should be zero, the ideal value for this parameter is zero. However a small number of transitions can be tolerated as long as the ration remains relatively low. As the number of teeth in the clock track increases (larger symbols) more transitions in the quiet zone can be tolerated. Also, more transitions in the clock track (which are really imperfections) will tend to *improve* this measurement. The grading scheme for this transition ratio is:

Transition Ratio %	Grade
<6	A
<8 (but more than 6)	B
<10 (but less than 8)	C
<12 (but less than 10)	D
>12	F

        The value of the grade will be the highest modulation level for which the ratio gives a grade from the above table of that modulation level or higher.

13. RTR
    Right Transition Ratio
        Transition ratio (see Top Transition Ratio) for the right clock track in relation to the right quiet zone.

14. TCT
    Top Clock Track
        This is a grade based on imperfections in the top clock track. Some imperfections in the clock track can be tolerated. However, the rule that must be maintained for a passing grade is that three out of every five modules (on a consecutively rolling window of five modules) must be correct. The value of the grade will be the highest modulation level for which this test passes.

15. RCT
    Right Clock Track
        This is a grade based on imperfection in the right clock track (see Top Clock Track).