

Appendix L: LVS® 95XX Data Matrix Calibrated Conformance Standard Test Card

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GS1 Solution Partner



Disclaimer

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For the latest version of this manual, or for technical support, see your local Omron website. Your local Omron website can be located by visiting <https://www.ia.omron.com/> and selecting your region from the Global Network panel on the right side of the screen.

Omron Microscan Systems, Inc.

IMPORTANT NOTE – PLEASE READ

The Data Matrix Calibrated Conformance Standard Test Card (CCSTC) has changed from 7 symbols to 12 symbols. This new Test Card now supports X-Dimensions as low as 7.9 mils (0.200 mm). Not all LVS-95XX systems can grade symbols this small. Please check the CCSTC Data Matrix Resolution Limit Table below to confirm the resolution limits of your verifier. Also, this Data Matrix Conformance Test Card is now used to calibrate all LVS-95XX-HD verification systems.

Data Matrix Conformance Calibration Standard Test Cards

The Data Matrix Conformance Calibration Standard Test Cards (CCSTCs) contain 12 Data Matrix Primary Reference Test Symbols that have specific parameter measurements for ANU, GNU, UEC, FPD, CU, Rmax, and Rmin. The 2D Primary Reference Test Symbols are JUDGE-CERTIFIED and NIST traceable as specified in ISO-15426-2:2015 and ISO-15415 for Reflectivity and Linear Dimensions.

Most of the 95XX Verifiers were designed to be calibrated using a 1D CCSTC. Once calibrated with a 1D CCSTC, a Data Matrix Conformance Calibration Standard Test Card can be used to validate these systems' performance grading 2D symbols. This is not a calibration step, but a confirmation that the calibrated device produces the correct grades on a reference 2D symbol.

The exceptions to this rule are the 9585-DPM-HD and 9580-DPM-HD models, which require the use of a Data Matrix CCSTC for calibration.

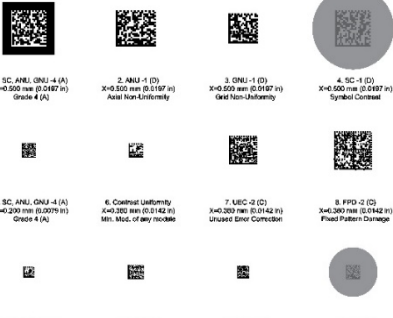
There are two Data Matrix Test Cards (see images below). One card is a Version E and the other is a Version G, as indicated at the bottom right of the Calibration Test Card. Version E uses ISO/IEC Standards. Version G uses GS1 Standards for Symbol 1 through Symbol 4.

For non-“HD” verifiers, purchase of a Data Matrix Calibrated Conformance Test Card is optional.

IMPORTANT: Please read the document entitled “Read Me First” included with the Data Matrix test card as it provides detailed instructions about the test card.

Appendix L: LVS-95XX Data Matrix Calibrated Conformance Standard Test Card

CONFORMANCE CALIBRATION STANDARD TEST CARD FOR ISO/IEC Data Matrix



1. SC: ANU, GNU - 4 (A)
X=0.500 mm (0.0197 in)
Grade 4 (A)

2. ANU - 1 (D)
X=0.500 mm (0.0197 in)
Axial Non-Uniformity

3. GNU - 1 (D)
X=0.500 mm (0.0197 in)
Grid Non-Uniformity

4. SC - 1 (D)
X=0.500 mm (0.0197 in)
Symbol Contrast

5. SC: ANU, GNU - 4 (A)
X=0.200 mm (0.0079 in)
Grade 4 (A)

6. Contrast Uniformity
X=0.200 mm (0.0079 in)
Min. Mod. of any module

7. UEC - 2 (C)
X=0.200 mm (0.0079 in)
Unread Error Correction

8. FPD - 2 (C)
X=0.200 mm (0.0079 in)
Fixed Pattern Damage

9. Contrast Uniformity
X=0.270 mm (0.0106 in)
Min. Mod. of any module

10. ANU - 1 (D)
X=0.200 mm (0.0079 in)
Axial Non-Uniformity

11. GNU - 1 (D)
X=0.200 mm (0.0079 in)
Grid Non-Uniformity

12. SC - 1 (D)
X=0.200 mm (0.0079 in)
Symbol Contrast

SN: Example Data Wavelength: 660 nm
Cal. Date: 12-Sept-2019 Syn. Apert: 0.8 X-Dim

#1 Grade 4.0 (A)	#5 Grade 4.0 (A)	#10 Grade 1.0 (D)
SC 82.6%	SC 82.8%	ANU 10.9%
Rmax 84.6%	Rmax 85.0%	
Rmin 2.0%	Rmin 2.2%	
ANU 0.2%	ANU 0.0%	
GNU 2.1%	GNU 1.6%	
		#11 Grade 1.0 (D)
		GNU 10.9%
		SC 32.0%
		Rmax 33.9%
		Rmin 1.8%
#2 Grade 1.0 (D)	#6 Grade 4.0 (A)	
ANU 10.9%	CJ 30.7%	
		#7 Grade 2.0 (C)
		GNU 10.9%
		UEC 42.9%
		Gray Patches
#4 Grade 1.0 (D)	#8 Grade 2.0 (C)	
SC 31.8%	FPD 2.0	A 3.6 %R
Rmax 33.8%		B 86.4 %R
Rmin 2.0%		C 74.1 %R
		D 57.8 %R

See printed report for full details and traceability information

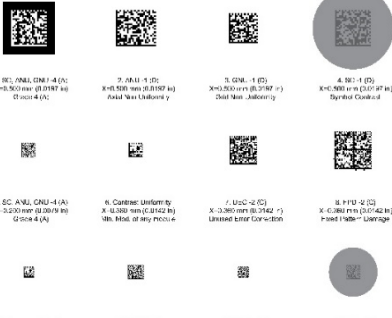
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IN-SERVICE DATE:
THIS CALIBRATION STANDARD IS CERTIFIED FOR 1
YEAR FROM THE IN-SERVICE DATE, BUT NO MORE
THAN 4 YEARS FROM THE CALIBRATION DATE.
BROWN ON THE CALIBRATION CERTIFICATE.

ACCUEGE Technology
NOT TRACEABLE - JUDGE CERTIFIED

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CONFORMANCE CALIBRATION STANDARD TEST CARD FOR ISO/IEC Data Matrix AND GS1 DataMatrix



1. SC: ANU, GNU - 4 (A)
X=0.500 mm (0.0197 in)
Grade 4 (A)

2. ANU - 1 (D)
X=0.500 mm (0.0197 in)
Axial Non-Uniformity

3. GNU - 1 (D)
X=0.500 mm (0.0197 in)
Grid Non-Uniformity

4. SC - 1 (D)
X=0.500 mm (0.0197 in)
Symbol Contrast

5. SC: ANU, GNU - 4 (A)
X=0.200 mm (0.0079 in)
Grade 4 (A)

6. Contrast Uniformity
X=0.200 mm (0.0079 in)
Min. Mod. of any module

7. UEC - 2 (C)
X=0.200 mm (0.0079 in)
Unread Error Correction

8. FPD - 2 (C)
X=0.200 mm (0.0079 in)
Fixed Pattern Damage

9. Contrast Uniformity
X=0.270 mm (0.0106 in)
Min. Mod. of any module

10. ANU - 1 (D)
X=0.200 mm (0.0079 in)
Axial Non-Uniformity

11. GNU - 1 (D)
X=0.200 mm (0.0079 in)
Grid Non-Uniformity

12. SC - 1 (D)
X=0.200 mm (0.0079 in)
Symbol Contrast

SN: Example Data Wavelength: 660 nm
Cal. Date: 12-Sept-2019 Syn. Apert: 0.8 X-Dim

#1 Grade 4.0 (A)	#5 Grade 4.0 (A)	#10 Grade 1.0 (D)
SC 82.6%	SC 82.8%	ANU 10.9%
Rmax 84.6%	Rmax 85.0%	
Rmin 2.0%	Rmin 2.2%	
ANU 0.2%	ANU 0.0%	
GNU 2.1%	GNU 1.6%	
		#11 Grade 1.0 (D)
		GNU 10.9%
		SC 32.0%
		Rmax 33.9%
		Rmin 1.8%
#2 Grade 1.0 (D)	#6 Grade 4.0 (A)	
ANU 10.9%	CJ 30.7%	
		#7 Grade 2.0 (C)
		GNU 10.9%
		UEC 42.9%
		Gray Patches
#4 Grade 1.0 (D)	#8 Grade 2.0 (C)	
SC 31.8%	FPD 2.0	A 3.6 %R
Rmax 33.8%		B 86.4 %R
Rmin 2.0%		C 74.1 %R
		D 57.8 %R

See printed report for full details and traceability information

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IN-SERVICE DATE:
THIS CALIBRATION STANDARD IS CERTIFIED FOR 1
YEAR FROM THE IN-SERVICE DATE, BUT NO MORE
THAN 4 YEARS FROM THE CALIBRATION DATE.
BROWN ON THE CALIBRATION CERTIFICATE.

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***Note:** If you have purchased an LVS-958X-DPM-HD Verification system (1.35" / 34.29 mm FOV), one of the above cards will be provided with the unit to use as a calibration card. Symbol 1 on the calibration card will be used to calibrate the system.

LVS-95XX Product Limitations

The 2D CCSTCs have certain symbols that are too small to be graded by some models of the LVS-95XX Barcode Verifiers. Please follow the table below to understand which symbols are valid when using your specific LVS-95XX Verification System. The sections marked in light red indicate limitations.

LVS-95XX CCSTC RESOLUTION LIMIT TABLE		
LVS PRODUCT	Required Calibration Test Card	Data Matrix Calibration Card 98-CAL022 Test Symbols Grading Limits
9510-5-1.75	98-CAL020 (dated) 98-CAL020-01 (undated)	ALL Symbols 1 through 12
9510-5-3.0	98-CAL020 (dated) 98-CAL020-01 (undated)	ALL Symbols 1 through 12
9510-5-4.0	98-CAL020 (dated) 98-CAL020-01 (undated)	Symbols 1, 2, 3, 4, 6, 7, 8, 9 only
9510-5-4.5	98-CAL020 (dated) 98-CAL020-01 (undated)	Symbols 1, 2, 3, 4, 6, 7, 8, 9 only
9510-5-6.250	98-CAL021 (dated) 98-CAL021-01 (undated)	Symbols 1, 2, 3, 4, 6, 7, 8, only
9580-5-3.0	98-CAL020 (dated) 98-CAL020-01 (undated)	ALL Symbols 1 through 12
9585-3.0	98-CAL020 (dated) 98-CAL020-01 (undated)	ALL Symbols 1 through 12
9585-DPM-HD	98-CAL022 (dated) 98-CAL022-01 (undated)	ALL Symbols 1 through 12
9570-5-5.4	98-CAL020 (dated) 98-CAL020-01 (undated)	Symbols 1, 2, 3, 4, 6, 7, 8, only

Purchasing a Data Matrix CCSTC

Contact your Omron sales representative or distributor to purchase a Data Matrix CCSTC.

Data Matrix CCSTC Part Numbers		
Part Number	Description	Note
98-CAL022	ISO/IEC Data Matrix CCSTC	Dated when shipped from Omron factory
98-CAL022-01	ISO/IEC Data Matrix CCSTC	Undated. In-service date must be filled in by customer or reseller.
98-CAL023	GS1 Data Matrix CCSTC	Dated when shipped from Omron factory
98-CA023-01	GS1 Data Matrix CCSTC	Undated. In-service date must be filled in by customer or reseller.

Replacing a Conformance Calibration Standard Test Card

CCSTCs can typically be used for two years from the date they are put into service. The typical two year usage period assumes the cards are protected from light, dirt, grease and physical damage while not in use.

Cards that are not put into use and are stored in their original shipping envelopes before being put into service will generally still have 2 years of useful life, but in any case should not be used more than 4 years past the "Date Processed."

Date processed.

**CONFORMANCE CALIBRATION
STANDARD TEST CARD
FOR ISO/IEC Data Matrix AND GS1 DataMatrix**

Wavelength: 660 nm
Syn. Aper: 0.8 X-Dim

Target	SC	Rmax	Rmin	ANU	GNU
#1 Grade 4.0 (A)	82.6%	84.6%	2.0%	0.2%	2.1%
#2 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%
#3 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%
#4 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%
#5 Grade 4.0 (A)	82.6%	84.6%	2.0%	0.2%	2.1%
#6 Grade 4.0 (A)	82.6%	84.6%	2.0%	0.2%	2.1%
#7 Grade 2.0 (C)	42.9%	42.9%	42.9%	42.9%	42.9%
#8 Grade 2.0 (C)	42.9%	42.9%	42.9%	42.9%	42.9%
#9 Grade 4.0 (A)	82.6%	84.6%	2.0%	0.2%	2.1%
#10 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%
#11 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%
#12 Grade 1.0 (D)	10.9%	10.9%	10.9%	10.9%	10.9%

Gray Patches

Patch	A	B	C	D
1	3.6 %R	36.4 %R	74.1 %R	57.8 %R

See printed report for full details and traceability information

In-Service Date.