

LVS[®] 9580/9585 Operating Instructions

English



LVS-9580



LVS-9585

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Tel: +1.425.226.5700 / 800.762.1149

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GS1 Solution Partner



Disclaimer

The information and specifications described in this manual are subject to change without notice.

Latest Manual Version or Technical Support

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.

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Important Information

- The LVS-9580/9585 arrives site packaged in a specially designed shipping carton. DO NOT discard this shipping carton in case the system needs to be shipped or stored for any reason. Failure to use this carton when returning the product to Omron Microscan will void the warranty.
- This guide is intended to help the user understand the features and functionality of the LVS-9580/9585. Be sure to reference the following additional resources:
 - Refer to the “LVS-95XX Series Software Installation Guide” for steps on installing LVS-95XX Software. A hard copy version of the “LVS-95XX Series Software Installation Guide” is packaged with the system and an electronic version is located on the installation media.
 - Refer to the “LVS-95XX Series Barcode Quality Station Operations Manual” for comprehensive steps on operating LVS-95XX Software. This manual is located on the installation media packaged with the system.
- For questions or concerns about the performance of the LVS-9580/9585, please contact a local Omron Distributor or Omron Technical Support.

Safety Instructions

The LVS-9580/9585 has been carefully designed to provide years of safe, reliable performance. However, as with all electrical equipment, there are some basic precautions to avoid personal injury or damage to the system:

- Before using the system, carefully read all the installation and operating instructions.
- Observe all warning instruction labels on the system.
- Never insert anything into the openings of the system.
- Do not use the system near water or spill liquid into it.
- All components used to create the system are CE approved. All circuits were designed to incorporate maximum safety. However, any equipment using electrical voltages may cause personal injury if improperly handled.
- Do not attempt to work on the system with the USB cable connected.
- To avoid damaging the system, unplug the USB cable before cleaning.
- If the system ever needs repair, consult Omron Microscan or an Omron Microscan Distributor.



R-REM-MKO-XX-XX

Korean Radio Regulations (KC Mark)

The LVS-9580/9585 has been registered under Clause 3, Article 58-2 of the Radio Waves Act.

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매자 또는 사용자는 이 점을 주의하시기 바라
며, 가정외의 지역에서 사용하는 것을 목적으로

Statement of Compliance



Manufacturer: Omron Microscan Systems, Inc., 700 SW 39th St., Renton, WA 98057, USA

Производитель: «Омрон Майкроскан Системс Инк., США, Рентон, штат Вашингтон 98057, 700 SW 39th Street

Representative: Omron Electronics Limited Liability Company, 125040, Russian, Moscow, Ulitsa Pravdy, 26. OGRN 10677746976582

Представитель: Общество с ограниченной ответственностью "Омрон Электроникс", 125040, Российская Федерация, город Москва, улица Правды, дом 26, ОГРН 10677746976582

Date of Manufacture: The first two digits of the serial number are the two-digit year of manufacture, or the year of manufacture +20 for serial numbers starting with 3.

Дата изготовления: первые две цифры серийного номера являются двумя последними цифрами года изготовления + 20 для серийных номеров, начинающихся с 3.

About the LVS-9580/9585

The LVS-9580/9585 is a portable, handheld barcode verifier designed for off-line verification of barcodes to ISO/IEC standards. The LVS-9580/9585 is a 5.0 megapixel camera-based system that grades linear (1D) and two-dimensional (2D) codes up to 3 inches (76 mm) wide and up to 2 inches (51 mm) tall (including the quiet zone). See the “Quiet Zone” section below for more information on quiet zones.

The LVS-9580/9585 verifies barcode labels located on a variety of surfaces including corrugated cardboard boxes, shipping containers, and on a static (non-moving) web. The LVS-9580/9585 grades barcodes in either picket fence or ladder orientation.

Picket Fence Orientation



Ladder Orientation



The LVS-9580/9585 is 21 CFR Part 11 Compliant-Ready.

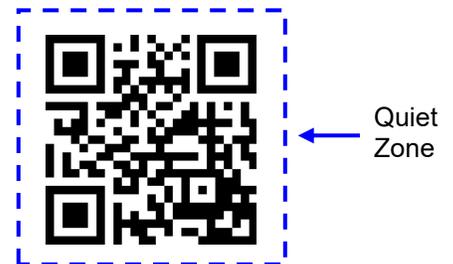
Quiet Zone

The **quiet zone** is a clear space preceding the start character of a barcode symbol and follows the stop character. When reading/grading a barcode symbol, adequate space for the quiet zone must be allowed. The required quiet zone space for each barcode varies by symbology. An error message appears on the computer screen if not enough space has been allowed for the quiet zone.

1D Barcode Quiet Zone



2D Barcode Quiet Zone



Hardware Overview

The LVS-9580/9585 is comprised of the following hardware components:



LVS-9580/9585 with USB cable and software installation drive.

Note: The image below shows the device *approaching* the symbol to be verified. The four rubber feet at the corners of the verifier window must be placed on the surface where the symbol is printed or marked.

The position of the device shown at left more closely approximates the orientation required in an application setting.



Important: The label shown above is 4" x 4". The long linear symbol on the label would not fit in the field of view without using the Stitching Feature described in the *LVS-95XX Series Operations Manual*.

LVS-95XX Software Steps

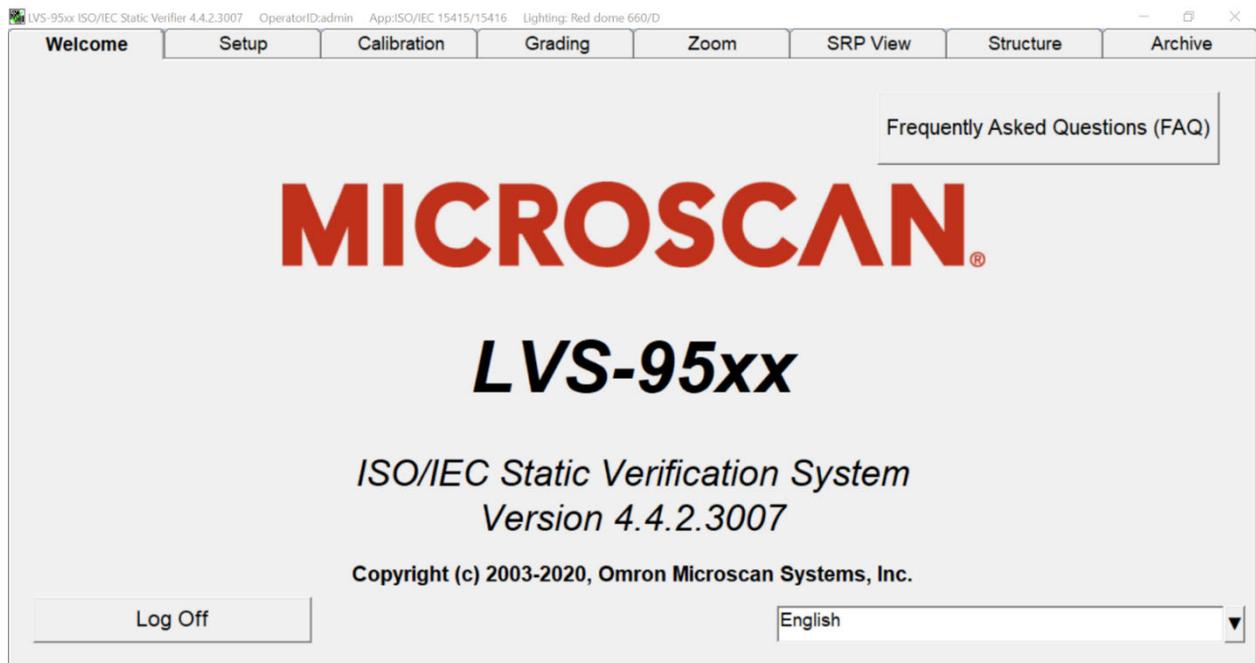
Refer to the sections below for steps on:

- Logging in to LVS-95XX Software
- Turning on the LVS-9580/9585 camera
- Calibrating the LVS-9580/9585

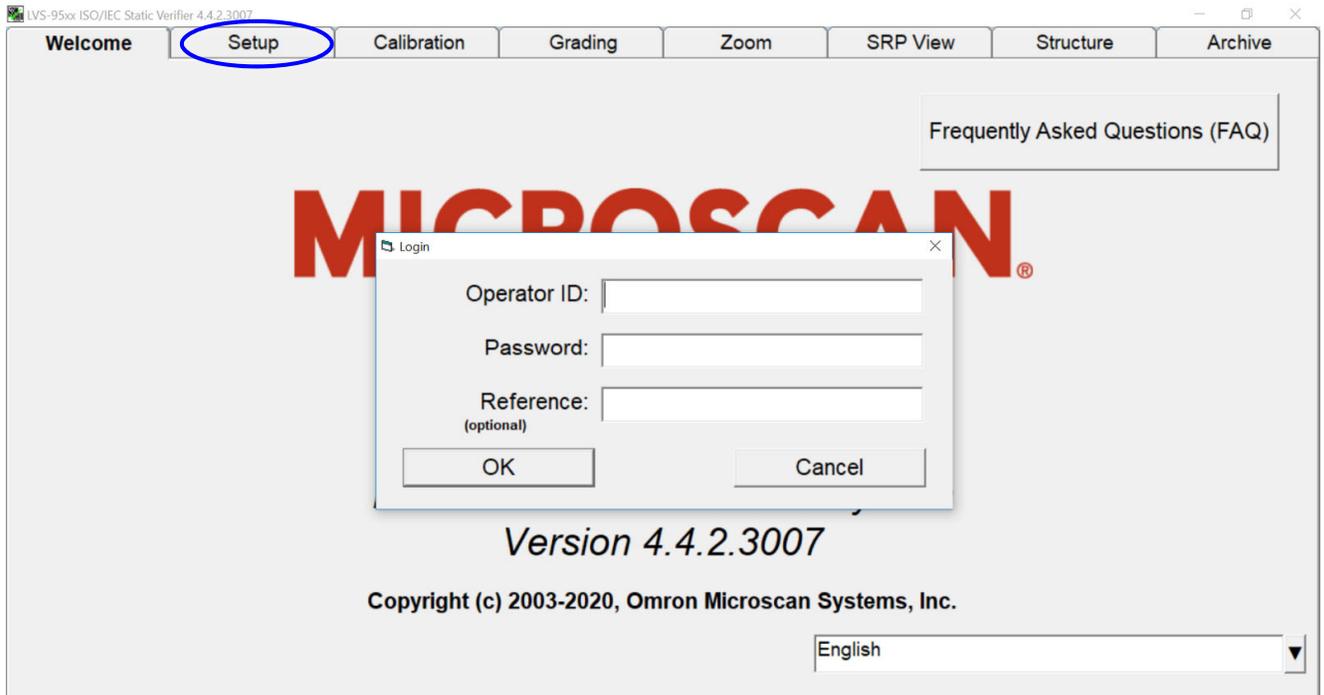
Note: Refer to the “LVS-95XX Series Software Installation Guide” for step-by-step instructions on installing LVS-95XX Software; a hard copy version of this guide is packaged with the system and an electronic version is located on the installation media.

Log In to LVS-95XX Software

1. Start LVS-95XX Software. The “Welcome” screen appears (see below).



2. Click the “Setup” tab. The “Login” box appears.



2. Enter **admin** (not case sensitive) in the **Operator ID** field and in the **Password** field.
3. Click “OK.” LVS-95XX Software will open.
4. Turn on the LVS-9580/9585 camera by following the steps in the next section entitled “Turn on the LVS-9580/9585 Camera.”

Turn On the LVS-9580/9585 Camera

1. Click the “Setup” tab and select “9580/9585” in the “Camera” section (see below).

The screenshot shows the 'Setup' tab of the LVS-9580/9585 interface. The 'Camera' section is highlighted with a blue box, showing 'Off' selected and '9580' and '#2 (5MP)' as options. The 'Grading mode' section is also highlighted with a blue box, showing 'Automatic' selected and 'Auto-sector' as an option. A blue arrow points from the 'Auto-sector' option to the 'Optional features' section, where 'Single sector verification (normal)' is selected. Other sections include 'Application standards', 'System Settings', and 'Current information'.

Annotations on the left side of the screenshot:

- LVS-9580 / LVS-9585 (points to the camera options)
- Additional camera (points to the camera options)
- Select the “Auto-Sector” option (points to the 'Auto-sector' option in the Grading mode section)

Note: When using only the LVS-9580/9585 (with no other LVS-95XX barcode verifier, such as the LVS-9510), “9580/9585” will be the only camera listed in the “Camera” section. When using the LVS-9580/9585 with the LVS-9510 (5 MP), both cameras appear in the “Camera” section. Select “9580/9585.”

2. Select “Auto-Sector” in the “Grading Mode” section (see screenshot above). This allows LVS-95XX Software to locate a barcode within the field of view and automatically draw a sector around the barcode.
3. Next, calibrate the LVS-9580/9585 (if using for the first time). See the next section for calibration steps.

Calibrate the LVS-9580/9585

IMPORTANT:

The LVS-9580/9585 should be calibrated regularly. The entire calibration process takes less than 30 seconds to complete and ensures the LVS-9580/9585 is certified according to industry standards.

Always use a clean, damage-free calibration card. Omron recommends replacing the Calibrated Conformance Standard Test Card every two years. The card should be replaced sooner than two years if it becomes damaged or dirty.

Omron recommends cleaning the LVS-9580/9585 window prior to calibration. See the “Cleaning Instructions” section for more information.

1. To calibrate the LVS-9580/9585, click the “Calibration” tab.
2. Locate the Calibrated Conformance Standard Test Card (“test card”) that was packaged with the system and place the test card on a flat surface.

Calibration Card Reference

Model	Calibration Card Type	Replacement P/N	Symbol Number on Card
LVS-9580 HD	Data Matrix	98-CAL022	Data Matrix Symbol 1
LVS-9585 HD			
LVS-9510 6.25"	GS1-128	98-CAL021	GS1-128
All Other LVS-95XX Products	EAN/UPC (Shown Below)	98-CAL020	UPC-A or EAN-13

Example of a UPC/EAN test card:

3. Firmly grip the LVS-9580/9585 handle. There is no need to pull the trigger at this time (pulling the trigger causes the LVS-9580/9585 to capture a live image; however, the image is automatically live while the system is in Calibration mode).
4. Place the LVS-9580/9585 window over one of the Master Grade barcodes making sure the four rubber feet surrounding the window rest firmly on a flat, stable surface. The rubber feet hold the test card in place and prevent movement of the test card. See example of Master Grade barcodes above. It is important to note that not all of the rubber feet will fit onto the calibration card.

Not all of the rubber feet will fit onto the calibration card.

**CONFORMANCE CALIBRATION STANDARD
ENHANCED TEST CARD
FOR UPC/EAN SYMBOL VERIFIERS
USING 6 MIL APERTURES**

EAN-13 MASTER GRADE UPC-A MASTER GRADE

FAIL	 0 1 2 3 4 5 6 7 8 9 0 5
P	
A	
S	
S	
DECODABILITY:	84.8 %
CONTRAST:	83.0 %
MODULATION:	84.7 %
RMAX:	86.6 %

3.6 %R		86.0 %R
DEFECTS (VOID)		DECODABILITY (BAR)
22.7 %		43.5 %

CALIBRATION #:	UPCE-21257	 55.4 %R
WAVE LENGTH:	660 nm	
EFF. APER:	0.006 in.	
CONTRAST 48.0 %		 7.9 %R

APPLIED IMAGE Inc 1653 East Main Street
Rochester, NY 14609
Voice: (585) 482-0300
Fax: (585) 288-5989
www.appliedimage.com

DATE ISSUED: **30 Aug 2017**

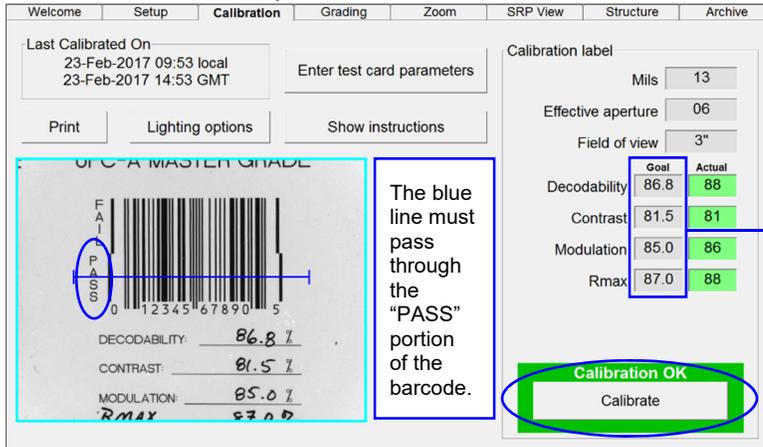
THE STANDARD IS CERTIFIED FOR 2 YEARS FROM IN SERVICE DATE WHEN HANDLED IN ACCORDANCE WITH USE OF CALIBRATED CONFORMANCE STANDARDS DOCUMENTATION.

© 1997, 2015, Applied Image, Inc. ALL RIGHTS RESERVED

PART NO. AI-CCS-UPC/EAN-ENHANCED REV R
NIST TRACEABLE - JUDGE CERTIFIED

- On the “Calibration” tab, make sure the blue line travels through the middle of the PASS portion of the barcode as shown below.

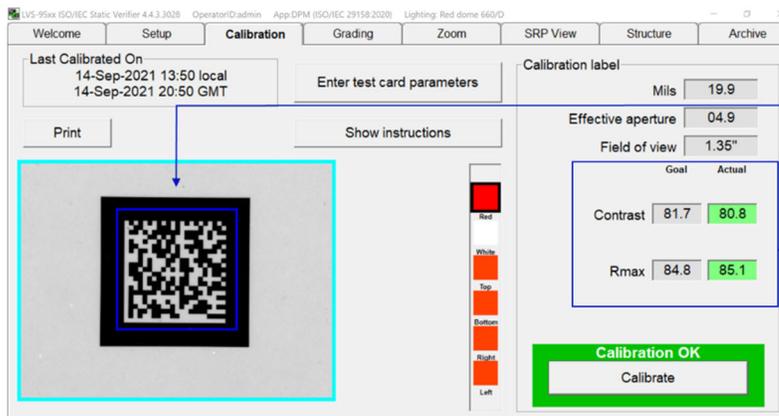
LVS-9580 / LVS-9585 (UPC/EAN Calibration Card, 98-CAL-020)



The blue line must pass through the “PASS” portion of the barcode.

Enter the Decodability, Contrast, Modulation, and Rmax values from the UPC/EAN Calibration Card in the Goal column shown at left.

LVS-9580 HD / LVS-9585 HD (Data Matrix Calibration Card, 98-CAL-022 or 98-CAL023)



Place Symbol #1 of the Data Matrix Calibration Card within the field of view so that it is roughly equidistant from the borders of the blue sector box, as shown at left.

Be sure the Contrast and Rmax values under Goal match those printed on the Calibration Card. If they do not match, either you have the wrong card for the system or you must change the Goal values.

- Click the **Calibrate** button.
 - Successful calibration is indicated by a green “Calibration OK” message. Failed calibration is indicated by a red “Calibration Needed” message.



- If calibration fails:
 - Re-scan the Master Grade symbol and follow the above steps to calibrate. It may take two or three attempts before calibration is complete.
 - If calibration continues to fail, contact Omron Microscan or an Omron Microscan representative for further instructions.

IMPORTANT: The calibration score will hardly ever match exactly; this is normal and acceptable as long as the scores are within $\pm 3\%$ for Contrast, Modulation and Rmax, and $\pm 4.5\%$ for Decodability.

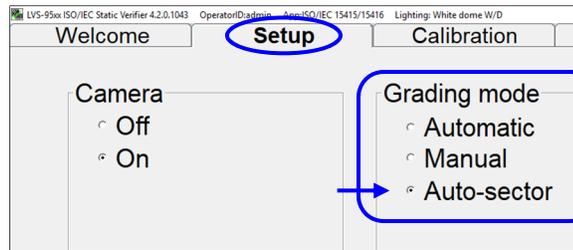
- When calibration is complete, click the “Grading” tab to grade barcodes. See the next section for steps on grading barcodes.

Verifying Barcodes (Excluding DPM Verification)

1. Click the “Grading” tab.
2. Firmly grip the LVS-9580/9585 handle and press and hold the trigger (do not release the trigger).
3. Place the LVS-9580/9585 window over the barcode ensuring the four rubber feet surrounding the window rest on the substrate (media/label material). The rubber feet hold the substrate in place and minimize movement of the substrate.
4. The barcode image appears on the customer-supplied computer screen with a green plus symbol (+) located on the barcode image.



Note: If the green plus symbol (+) is not appearing on the barcode image, click the “Setup” tab and make sure “Auto-sector” is selected in the “Grading mode” section (see below).



5. Slowly move the LVS-9580/9585 as needed to place the green plus symbol over the center of the barcode image (make sure the rubber feet rest on the substrate). Then, release the trigger.

Tip: Positioning the green plus symbol over the center of the barcode image may take a few moments when first learning to use the LVS-9580/9585. Position the center of the LVS-9580/9585 window as close as possible to the center of the barcode image. Please note that when moving the system, the camera reads in a mirrored view. For example, when the camera is moved to the right, the image moves left. If the camera is moved up, the image moves down.

6. LVS-95XX Software analyzes the barcode and reports a grade score between 4.0 and 0.0 on the “Grading” tab.

4.0/05/660/D

0.0/05/660/D

Refer to the “Grading Tab” section in the “LVS-95XX Series Barcode Quality Station Operations Manual” for more information on grading barcodes; this manual is located on the installation media packaged with the system.

Cleaning Instructions

The LVS-9580/9585 window may need to be cleaned daily, depending on use. Debris on the window may cause the LVS-9580/9585 to not grade accurately.

Locate the following supplies:

- Commercially available household glass cleaner, such as Windex®, Glassex®, or Mr. Muscle®.
Do not use an industrial-strength glass cleaner.
- Soft, lint-free, non-abrasive towel or cloth

Dampen the cloth with the household glass cleaner and gently wipe the window. Inspect the window closely, looking for any label debris that may be stuck on the window. Do not scrape the window with a sharp object as this may damage the window. Any damage to the window will be detected during the calibration process.

IMPORTANT:

DO NOT directly spray the window with glass cleaner; always spray a towel or cloth with household glass cleaner and then gently wipe the window.

DO NOT use an industrial-strength glass cleaner.

Please contact an Omron Distributor or Omron Technical Support with questions or concerns about the performance of the LVS-9580/9585.

Engineering Specifications

Physical Properties

Height	8.5"	215.9 mm
Width	4.75"	120.6 mm
Depth	5.5"	139.7 mm
Weight	<ul style="list-style-type: none"> Unpackaged Weight = 1 lb. 8 oz. (0.68 kg) Shipping weight (includes all items packaged in shipping box, such as cables, manuals, etc.) = Approx. 3 pounds 5 oz. (1.51 kg) 	

Imaging Device

- 5 megapixel camera
- Object Distance: Contact

Field of View

- 3.0" (76.19 mm) horizontally
- 2.25" (57.15 mm) vertically
- 1.75" x 1.75" (44 mm x 44 mm) for DPM (direct part mark) software selection
- 1.3" x 1.0" (33 mm x 25 mm) for LVS-958X HD models

Minimum Barcode X Dimension

- 1D = 4.0 mils (0.10 mm)
- 2D = 5.9 mils (0.15 mm)
- LVS-958X HD can verify a DPM Data Matrix symbol down to 2.0 mil (0.05 mm) and a standard Data Matrix down to 5.0 mil (0.127 mm).

Minimum PC Requirements

(PC Supplied by Customer)

- Windows® 10¹
- Intel® Core™ i3 Processor or equivalent
- 4 GB RAM
- One available USB 2.0 port

Power Requirements

- USB-Powered 5VDC @ 400mA

Light Source

- LVS-9580: Red 660 nm filter
- LVS-9585: Red dome (660 nm); White dome, 30° angle

Communication

- USB 2.0 A/MINI-B cable 2.0 m (6.5 ft.)



Operating Temperature

- -5° C (23° F) to 45° C (113° F)

Storage Temperature

- -20° C (-4° F) to 60° C (140° F)

Relative Humidity

- Operating: 20% to 80% (non-condensing)
- Storage: 20% to 95% (non-condensing)

Calibration

- EAN/UPC Calibrated Conformance Test Card
- Data Matrix Calibration Conformance Test Card (HD models only)

Safety Compliant

- RoHS/WEEE compliant
- CE

Specifications and images subject to change.

¹ The LVS-95XX software is currently supported on Windows 10 Professional and Windows 10 Enterprise operating systems. When this documentation refers to Windows 10, it is meant to refer to either of these two editions Windows 10 and excludes all other editions.

Supported Symbologies and Standards

Supported Symbologies

Symbology	Supported Standard(s)
Aztec	ISO 24778
Codabar	AIM BC3
Code 39	ISO 16388
Code 93	AIM BC5
Code-128	ISO 15417
Data Matrix	ISO 16022; DPM 29158, ISO 21471:2000, MIL-STD-130N, MIL-STD-130N + UII
Data Matrix Rectangular Extensions	ISO 21741
Direct Part Mark	ISO 29158:2020
EAN-13	ISO 15420 & GS1 General Specifications
EAN-13 with 2 Digit supplemental	ISO 15420 & GS1 General Specifications
EAN-13 with 5 Digit supplemental	ISO 15420 & GS1 General Specifications
EAN-13 with CC-A	ISO 15420, ISO 24723 & GS1 General Specifications
EAN-13 with CC-B	ISO 15420, ISO 24723 & GS1 General Specifications
EAN-8	ISO 15420 & GS1 General Specifications
EAN-8 with CC-A	ISO 15420, ISO 24723 & GS1 General Specifications
EAN-8 with CC-B	ISO 15420, ISO 24723 & GS1 General Specifications
GS1 Data Matrix	ISO 16022 and GS1 General Specifications
GS1 Databar – 14	ISO 24724 & GS1 General Specifications
GS1 Databar – 14 Stacked	ISO 24724 & GS1 General Specifications
GS1 Databar – 14 Stacked with CC-A	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar – 14 Stacked with CC-B	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar – 14 with CC-A	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar – 14 with CC-B	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Expanded	ISO 24724 & GS1 General Specifications
GS1 Databar Expanded CC-A	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Expanded CC-B	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Expanded Stacked	ISO 24724 & GS1 General Specifications
GS1 Databar Expanded Stacked CC-A	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Expanded Stacked CC-B	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Limited	ISO 24724 & GS1 General Specifications
GS1 Databar Limited with CC-A	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Limited with CC-B	ISO 24724, ISO 24723 & GS1 General Specifications

Symbology	Supported Standard(s)
GS1 Databar Omnidirectional	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Stacked Omnidirectional	ISO 24724, ISO 24723 & GS1 General Specifications
GS1 Databar Truncated	ISO 24724, ISO 24723 & GS1 General Specifications
GS1-128	ISO 15417 & GS1 General Specifications
GS1-128 with CC-A	ISO 15417, ISO 24723 & GS1 General Specifications
GS1-128 with CC-B	ISO 15417, ISO 24723 & GS1 General Specifications
GS1-128 with CC-C	ISO 15417, ISO 24723 & GS1 General Specifications
Han Xin	Draft AIM Specification
Interleaved 2 of 5	ISO 16390
ITF-14	ISO 16390 & GS1 General Specifications
Laetus Pharmacode	Laetus
MaxiCode	ISO 16023
Micro QR Code 2005	ISO 18004; DPM 29158, MIL-STD-130N, MIL-STD-130N + UII
MicroPDF417	ISO 24728
PDF417	ISO 15438
PPN (Pharmacy Product Number)	IFA Coding System / PPN-Code Specification
QR Code 2005	ISO 18004; DPM 29158, MIL-STD-130N, MIL-STD-130N + UII
UPC-A	ISO 15420 & GS1 General Specifications
UPC-A with 2 Digit supplemental	ISO 15420 & GS1 General Specifications
UPC-A with 5 Digit supplemental	ISO 15420 & GS1 General Specifications
UPC-A with CC-A	ISO 15420, ISO 24723 & GS1 General Specifications
UPC-A with CC-B	ISO 15420, ISO 24723 & GS1 General Specifications
UPC-E	ISO 15420 & GS1 General Specifications
UPC-E with 2 Digit supplemental	ISO 15420 & GS1 General Specifications
UPC-E with 5 Digit supplemental	ISO 15420 & GS1 General Specifications
UPC-E with CC-A	ISO 15420, ISO 24723 & GS1 General Specifications
UPC-E with CC-B	ISO 15420, ISO 24723 & GS1 General Specifications
USPS-128	USPS2000508

Additional Notes

- GS1 General Specifications can be obtained by contacting your local GS1 office.
- ISO Symbology Standards can be obtained from this link: <https://www.iso.org/standards.html>.
- AIM Symbology Standards can be obtained from this link: <https://www.aimglobal.org/aim-standards.html>.
In addition to adherence to the symbology specifications, LVS-95XX systems comply with the following standards:
- ISO 15415 - Barcode print quality test specification - Two-dimensional symbols
- ISO 15416 - Barcode print quality test specification - Linear symbols
- ISO 15426-1 - Barcode verifier conformance specifications - Part 1: Linear symbols

- ISO 15426-2 - Barcode verifier conformance specification - Part 2: Two-dimensional symbols

Application Standards

An Application standard is a specific protocol established by a group or industry, such as the military, hospitals, FDA, etc. Currently, the LVS-95XX Series supports the following Application standards:

- *AIAG / JAMA / JAPIA / ODETTE*
- *ALDI*
- *Chinese Sensible (Han Xin) Code*
- *DHL*
- *DPM (ISO/IEC 29158)*
- *DPM + HIBC*
- *DPM + MIL-STD-130N*
- *DPM + MIL-STD-130N + UII*
- *FPMAJ*
- *French CIP*
- *GS1 1D Report.doc²*
- *GS1 2D Report.doc¹*
- *GS1 General Specifications*
- *GS1 NTIN*
- *HDMA Guidelines*
- *HIBC*
- *IFAH*
- *ISO/IEC 15415/15416*
- *Italian Pharmacode*
- *ITF including 2 digits*
- *Japanese Codabar*
- *Laetus Pharmacode*
- *MIL-STD-130N*
- *MIL-STD-130N + UII*
- *Miniature Pharmacode*
- *Postal (IMB, Japan Post, Mailmark, PostNet)*
- *Postmatrix Code (PMC) with size checking*
- *Postmatrix Code (PMC) without size checking*
- *PPN Code*
- *PZN-big(German Pharmacode)*
- *PZN-normal (German Pharmacode)*
- *PZN-small (German Pharmacode)*
- *USPS Code 128*

² *GS1 1D Report.doc and GS1 2D Report.doc are the default custom reports. You can create your own custom report(s) by following the steps outlined in Appendix G: Special Features (refer to the section entitled “Custom Reports”).*

Appendix A – Verifying DPM Codes

The **LVS-9580** and **LVS-9585 Verifiers** are Direct Part Mark (DPM) verifiers. These Verifiers can be used to verify the symbol quality and structure of a Data Matrix or QR Code symbol that is permanently affixed to a manufactured item. Correct application standards must be used to verify the structure of the data contained in the direct part mark. This list of available standards is located on the Setup Screen. The software is programmed to use the following application standards:

- DPM ISO/IEC 29158:2020
- DPM + HIBC
- DPM + MIL-STD-130N w/Change 1 (16NOV2012)
- DPM + UII + MIL-STD-130N w/Change 1 (16NOV2012)
- GS1 TABLE 7 DPM (non-medical)
- GS1 TABLE 7 DPM (medical-ink)
- GS1 TABLE 7 DPM (medical, Direct A, connected)
- GS1 TABLE 7 DPM (medical, Direct B, not connected)

The LVS-9580 and the LVS-9585 Verifiers can also operate in conjunction with the LVS-9510 Verifier. Both the LVS-958x and LVS-9510 can be connected to the same computer, allowing you to switch between devices.

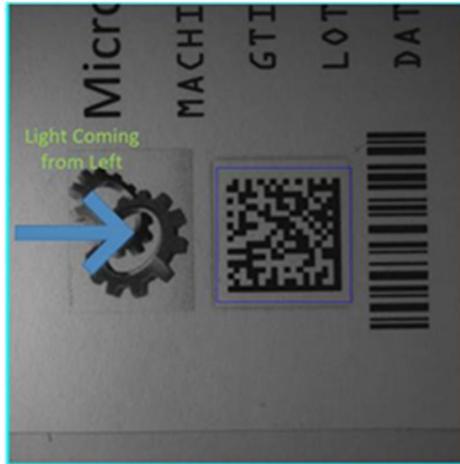
Note: The LVS-9510 does not support DPM verification.

DPM Verification

DPM verification does not follow the same rules as traditional 1D and 2D verification. Differences:

- All dot peen Data Matrix symbols must now be read with the L-pattern placed squarely in the field of view.
- **Symbol Contrast** is no longer measured. SC (Symbol Contrast) has been replaced with a new parameter called **Cell Contrast** (CC). A cell contrast value of 30% is now a 4.0 Grade.
- **Modulation** and **Reflectance Margin** are no longer measured. These two parameters are replaced with a new parameter called **Cell Modulation** (CM).
- The LVS-9580 DPM Verifier can grade a direct part mark on most surfaces. The usable field of view is limited to 1.75" (44 mm) by 1.75" (44 mm).
- The LVS-9580 HD has a usable field of 1.3" (33 mm) by 1.0" (25 mm).
- **Average Grade** (AG) is no longer reported. A parameter called **Distributed Damage Grade** (DDG) has taken its place. DDG indicates the average of the notional damage grade at the D Grade level.
- A parameter has been created called **Minimum Reflectance**. A Minimum Reflectance greater than or equal to **5%** is considered to be a 4.0 grade. If it is less than 5% then it is grade of 0.0.
- A parameter called **Symbol Rotation** indicates the angle of rotation within the verifier's field of view. Angles are measured clockwise and are reported as angles from -180° to +180°. Symbol Rotation was formerly called L1 Angle.
 - For Data Matrix symbols, normal (0° position) is indicated with the solid finder patterns (L pattern) on the left side and bottom of the symbol, clock tracks on the top and right side.
 - For QR Code symbols, normal (0° position) is indicated by finder patterns in the lower left, upper left and upper right corners of the symbol.
- A new parameter called **Sensor Angle** is introduced. Sensor Angle indicates the angle of rotation of a box bounding the symbol and the field of view of the verifier. That is, Sensor Angle is independent of whether the symbol is right side up, upside down or laying on its side. Sensor Angle is measured from 0° to 45°. According to the ISO/IEC 29158:2020 specification, Sensor Angle should be ≤3°.

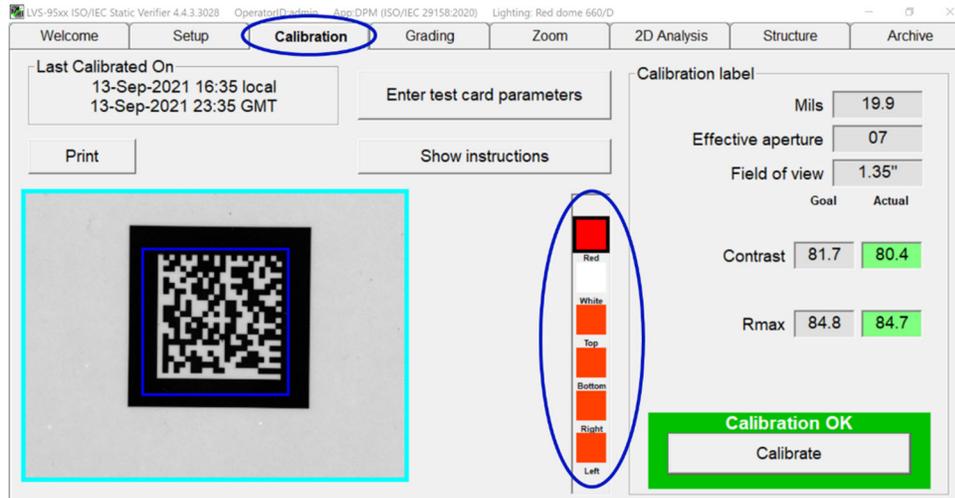
- A new parameter called **Light Direction** is introduced. Light Direction indicates the direction of the lights that were used to illuminate the symbol. If the lighting used for the symbol verification came from the side of the verifier closest to the bottom of the symbol, the light is indicated as South. Light coming from the right side of the symbol is designated as East, from the top of the symbol as North and from the left side as West.
 - Note that the lights on the verifier are now indicated as Top, Right, Bottom and Left. If a symbol is lit with the left bank of lights, and that symbol is rotated by -90° , the Light Direction is given as 30North. (30 because the lights on the LVS-9585 provide 30° low angle lighting.)



- The final grade now reports additional information:
DPM4.0/12/660/D
 - **DPM** = Indicates that the DPM rules have applied to the final grade.
 - **4.0** = Indicates the final grade. This final grade will always be a whole number.
 - **12** = Aperture Size
 - **660** = Color of the light. 660 = red, W = white.
 - **D** = Angle of the light source. D = Diffuse off-axis (Dome), 30 = 30° low angle.
 - When low angle light is used, the lighting direction is also specified:
 - Q = 4 direction (all four sides illuminated)
 - T = Two direction (lighting from two directions, either North-South or East-West)
 - S = One direction

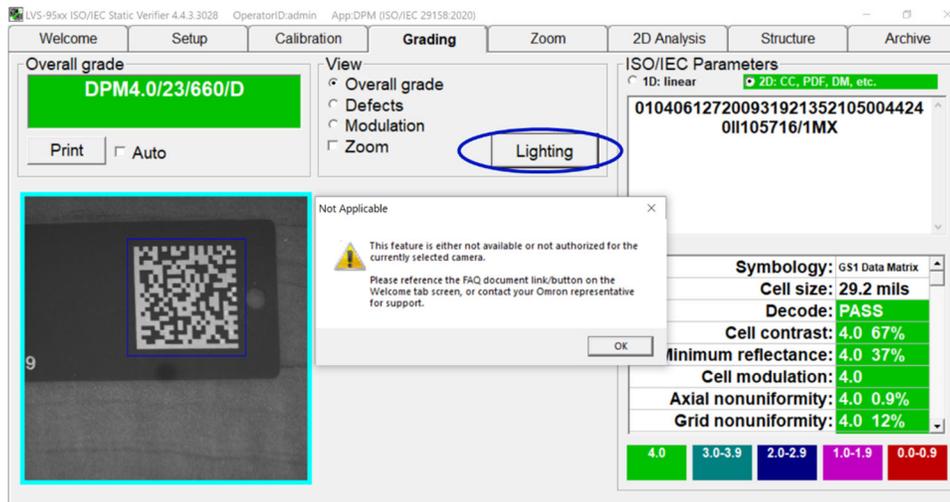
Calibration Screen

Follow the calibration procedure described on page 10. When using an LVS-9585, the **Calibration Screen** shows 6 lighting mode boxes on the right side of the viewing screen. During calibration, the Red and White box activates when that light mode is being calibrated. The individual Top, Bottom, Right, and Left light boxes do not activate during the calibration process. Clicking on the Red or White box confirms proper calibration for that lighting mode.



Lighting

LVS-9580 Grading use Red Dome lighting only. There is a button on Grading Screen titled **Lighting**. This button provides options to select different lighting configurations when using the LVS-9585, but has no benefit when using the LVS-9580.

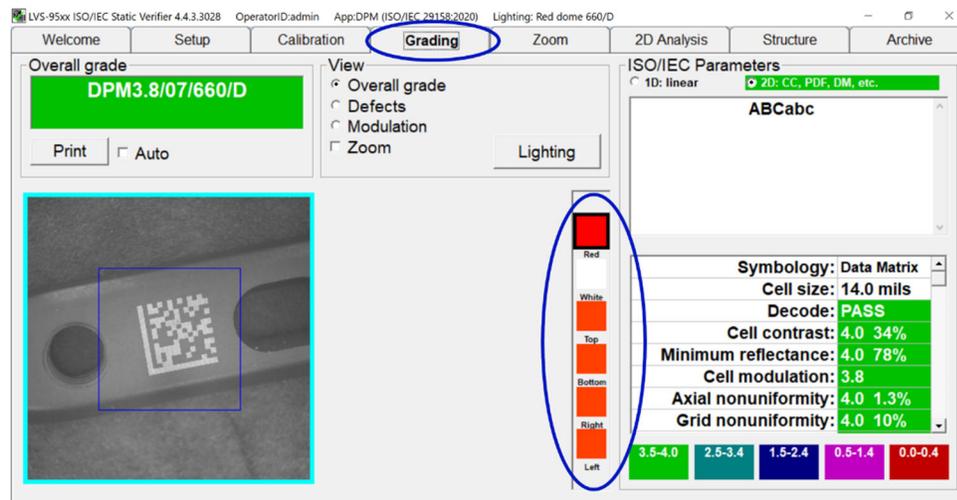


The **LVS-9585 DPM Verifier** is different from the LVS-9580 DPM Verifier due to the addition of 9 different lighting modes:

- RED Dome

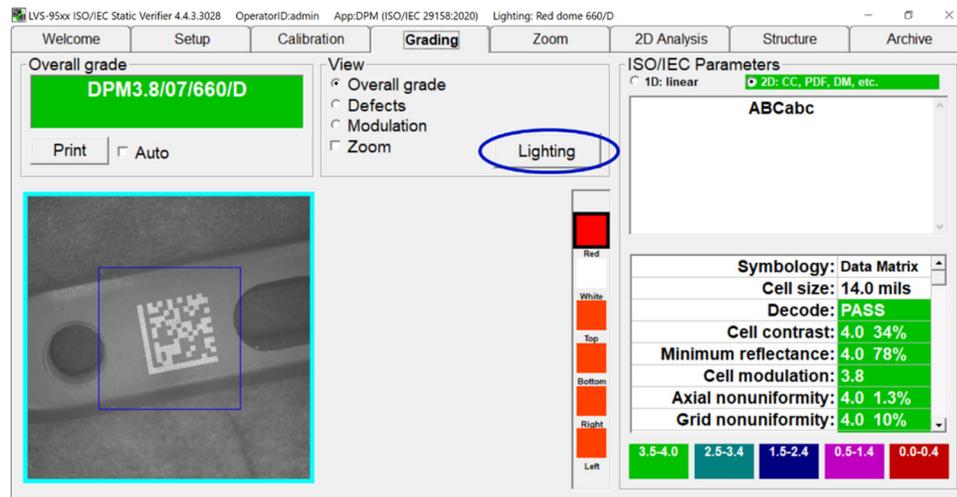
- WHITE Dome
- RED 30 degree Top + Bottom + Right + Left
- RED 30 degree Top + Bottom
- RED 30 degree Right + Left
- RED 30 degree Top
- RED 30 degree Bottom
- RED 30 degree Right
- RED 30 degree Left

These lighting modes are only available when using DPM Application Standards. They are not used for traditional 1D and 2D verification. The **LVS-9585 Grading Screen** shows 6 boxes on the right side of the viewing window. These will represent which lighting modes are being used to grade the DPM code.

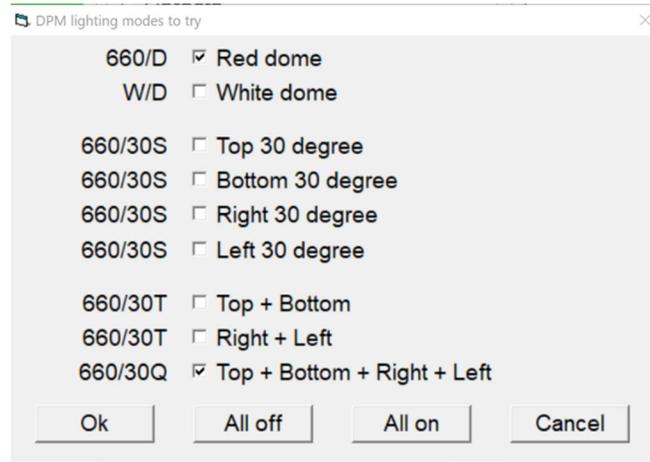


To choose the lighting modes when using an LVS-9585 verifier:

- Select the **Lighting** button on the **Grading Screen**.

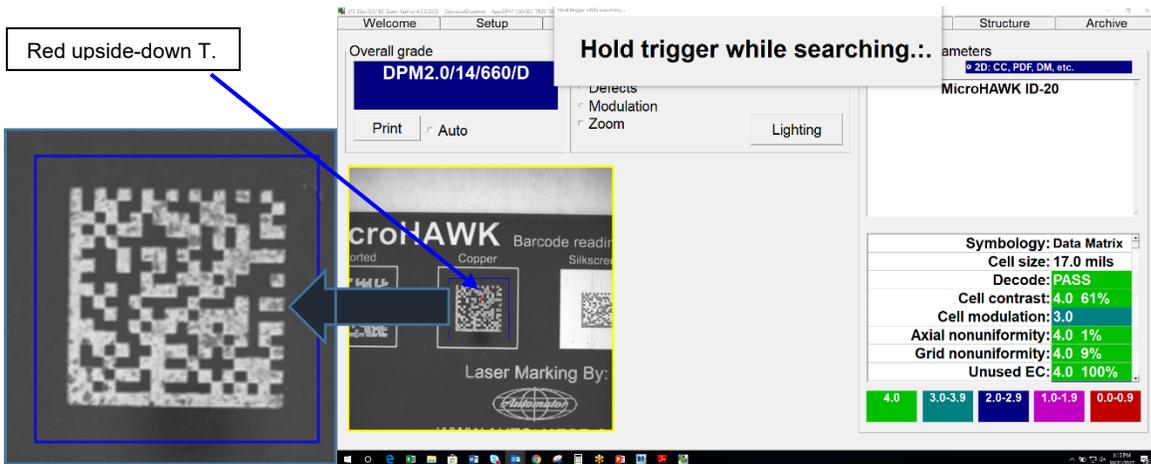


- Select the lighting mode. The default lighting modes are Red dome and 30 degree Top + Bottom + Right + Left. The operator may choose to add or subtract any of the lighting modes listed. The software uses the selection as the new default.

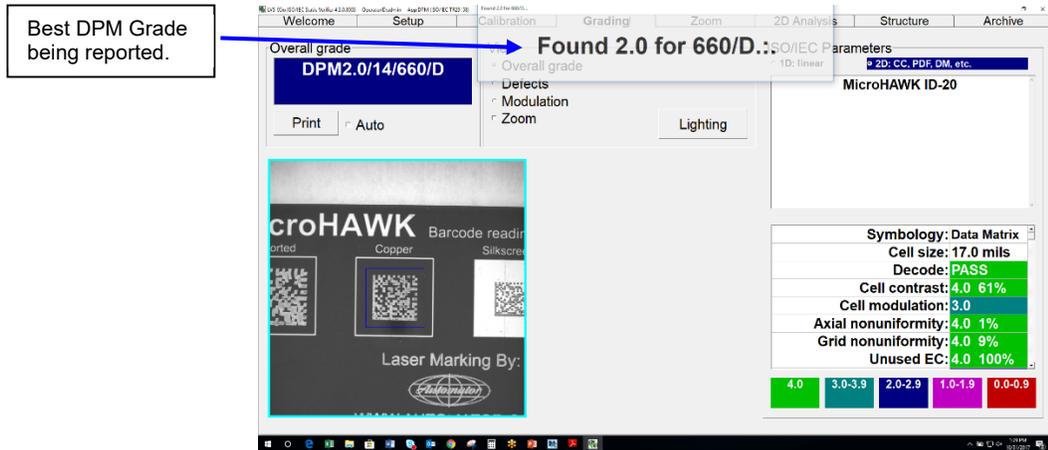


Grading a DPM Symbol

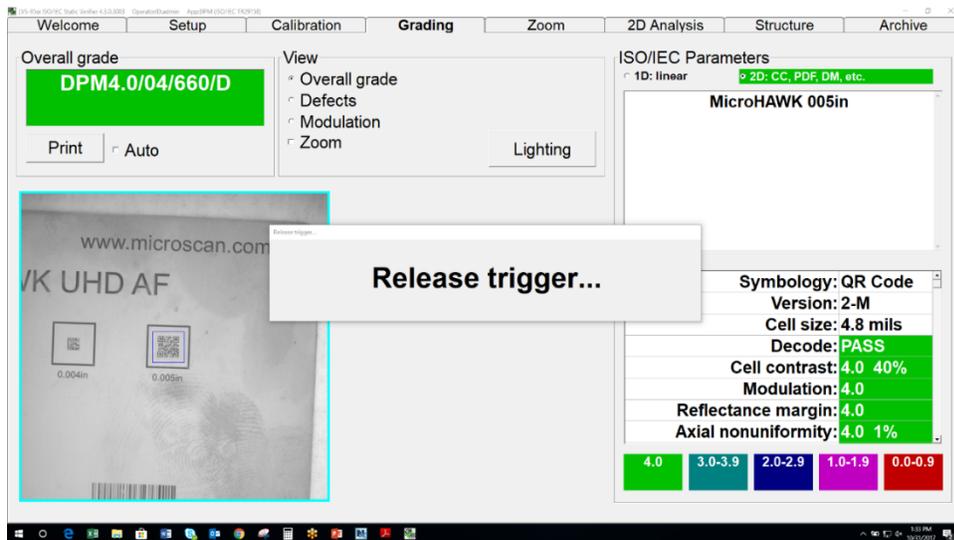
On the **Grading Screen** hold down the trigger switch. The target DPM indicator (an upside-down red letter 'T') then appears in the viewing window. A pop-up window appears at the top of the screen which says "Hold trigger while searching". Position the target DPM indicator so that it is in contact with the DPM symbol being graded. (Note: Positioning the target DPM indicator near the bottom of the symbol as show below is preferred for reflective metal parts to avoid the camera reflection interfering with the grading results.) Be sure the symbol is square to the field of view. Then hold the LVS-9580 steady. (The software does not grade the code until there is no motion detected.) After the symbol is found, the blue box will outline the symbol.



Once the software has found the DPM symbol, it will report what grade has been detected. There is a pop-up window at the top of the screen that reports the best grade found. It will not stop looking for a better grade until either an A Grade has been reached or the user releases the trigger.



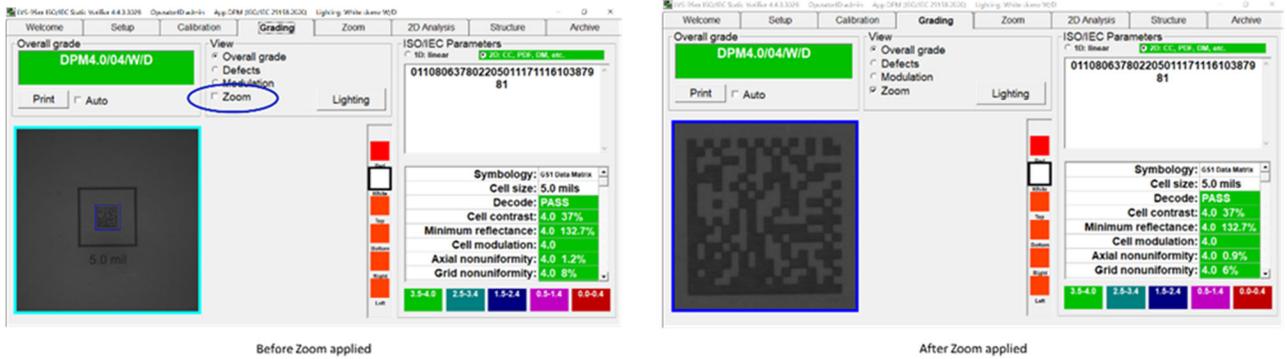
If an A Grade is found, a pop-up window advises the user to “Release trigger”.



The software will continue to change exposure (brightness) in an attempt to decode the symbol. The software will not stop looking or attempting to find the best grade until the trigger is released. If a symbol is not found after 20 seconds then the DPM mark should be re-oriented within the field of view and another attempt to grade should be made.

The Zoom Feature

A user can select the “Zoom” button located within the View Box. Then, after the grading process is done, the DPM symbol will be magnified. This will help in viewing small codes.



Remote Grading of a DPM Symbol

A user can push CTRL + SHFT and the software will interpret this as a trigger switch command. This is useful when the optional stand is used.

Grading with a Shiny Surface

Some direct part marks are created on a shiny metallic surface. When this occurs, the image of the camera can be seen in the center of the field of view. The operator needs to move the direct part mark away from the center of the screen so that the dark circle does not interfere with the grading process.

Drawing a Blue Sector

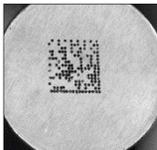
This feature is not allowed when grading a DPM symbol.

Try Re-Grading

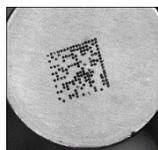
When a direct part mark fails to read, position the symbol in a different part of the field of view. The software is sensitive to motion and may capture a slightly blurred image, which will cause the software not to grade it correctly. The optional accessory stand, part # 98-9000125-01, can be used to hold the LVS-9580 in a fixed position.

Keep the “L” pattern square to the field of view.

For most dot peen DPM symbols, the cells are formed by dots and are not connected to each other. This will prompt the software to enhance the image by “connecting the dots”. However, the operator must keep the L-pattern square to the field of view in order for the software to grade the symbol correctly.



Correct:
DPM symbol
is square to
the FOV



Incorrect:
DPM symbol
is not square
to the FOV

Structure Screen

This system is designed to check the **Data Structure** for compliance to industry standards for MIL-STD-130, UII, and GS1. The embedded data is listed along with a description of what it stands for and reports the value used to determine what the embedded data is. The Data Structure Analysis can be printed.

Embedded data	Description	Value
]P>		
<RS>		
06		
<GS>		
17	U.S. DoD CAGE Code	(17V)
<230>	Latch to C40	
V4E5U8	Value for (17V)	4E5U8
<GS>		
1P	Item Identification Code assigned by Supplier	(1P)
TEL-206-623-4949	Value for (1P)	TEL-206-623-4949
<GS>		
S	Traceability Number for an Entity	(S)
WWW.UID2GO.COM	Value for (S)	WWW.UID2GO.COM
<254>	Unlatch	
<RS>		
<EOT>		

Reports

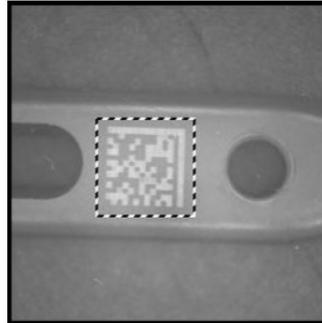
All results measured by the software are available in a printed report. These reports are also archived for future examination. An image of the direct part mark is attached to the printed report.

Omron Microscan Systems, Inc. LVS-95xx Verification Report

Overall: DPM2.4/07/W/D

Operator signature

Second signature



2D	
Symbology	Data Matrix
Decoded text	ABCabc
Cell size	13.8 mils
Decode	PASS
Cell contrast	2.4 22%
Minimum reflectance	4.0 21.3%
Cell modulation	3.7
Axial nonuniformity	4.0 0.4%
Grid nonuniformity	4.0 17%
Unused EC	4.0 80%
Fixed pattern damage	3.3
L1 (left of L finder)	3.3
L2 (bottom of L finder)	4.0
QZL1 (left quiet zone)	4.0
QZL2 (bottom quiet zone)	4.0
CTR (clock track regularity)	4.0
CTD (clock track damage)	4.0
SFP (solid fixed pattern)	4.0
OCTASA (overall clock track and solid area)	4.0
DDG (distributed damage grade)	4.0

Other information	
Letter Grade	C
ReportID	224
Operator	admin (LVS Administrator)
Application standard	DPM (ISO/IEC 29158:2020)
Limit Action	Generate warning but don't change grade if Xdim or symbol height is outside limits
Effective aperture	Reference number 07 (6.9 mil)
Lighting	W/D
Date and time	13-Sep-2021 18:57 local; 14-Sep-2021 01:57 GMT
Time zone	GMT -7
Sector size	0.24" by 0.24"
Last calibration	04-May-2018 07:46 local; 04-May-2018 14:46 GMT
Field of view	0.79" (camera is 1536x1536 pixels)
Serial numbers	Unit: 1808287, Camera: 9810389, Model: 9585
Software product and version	LVS-95xx Version 4.4.3.3028
LVS-95xx manufactured by:	Omron Microscan Systems, Inc. 700 SW 39th Street, Ste. 100 Renton, WA 98057 USA http://www.microscan.com