LVS® 7500

INFORMATION BOOKLET

VISION TECHNOLOGY FOR THERMAL PRINTERS

LVS®

THE LEADING PROVIDER OF
PRINT QUALITY INSPECTION SYSTEMS

LVS® IS AN ISO 9001:2008 REGISTERED COMPANY

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IMPORTANT

- While all information contained in this document is believed to be accurate and complete, the continual improvements of LVS® products may cause information in this document to become outdated. Please contact LVS® or your Distributor if you have product questions or to verify you have the most current version of the document.
- The information in this guide is for informational purposes only. It is not intended for use as an Operations Manual.

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PRODUCT OVERVIEW

The LVS® 7500 offers 100% print quality inspection and barcode verification for Thermal and Thermal Transfer Printers. Built on the powerful LVS® 7000 software platform, the LVS® 7500 functions include master-to-label comparison (blemish detection), barcode verification (1D and 2D), barcode validation (1D and 2D), optical character recognition (OCR), optical character verification (OCV), PDF Comparison, field matching, and number/data validation. Learn more about each function in the following sections.

Additionally, the powerful software includes automatic setup for quick label and field identification, job retrieval for recall or modification of previous runs, and a robust alarm matrix for user defined I/O interaction with peripheral devices including line and printer stop capabilities.

The LVS® 7500 provides a cost-effective means to identify defects, eliminate fines and disputes, avoid liability, reduce re-work, and control waste resulting from labeling or print quality errors. The LVS® 7500 is ideal for:

- Pharmaceuticals
- Medical Devices
- Clinical Trials
- Contract Packaging
- Manufacturing
- Label Converting

The LVS® 7500 is 21-CFR part 11 compliant ready, offering multiple security levels and comprehensive data management and reporting options for quality control and customer assurance.

SYSTEM CAPABILITIES

Functions of the LVS® 7500 include:

- Bar Code Validation (Reading of 1D and 2D Codes). The LVS® 7500 decodes 1D (linear) and 2D (two-dimensional) codes (including ECC-200 Data Matrix, Composite, QR Code, PDF-417 and Micro PDF) and determines if the code is "readable." No attempt is made to grade the codes according to any standard. This module may be used with a monochrome or color camera.

- Bar Code Verification (Grading of 1D and 2D Codes to ISO/IEC Standards). The LVS® 7500 verifies (decodes and grades) 1D (linear) and 2D (two-dimensional) codes including ECC-200 Data Matrix, Composite, QR Code, PDF-417 and Micro PDF symbologies according to the internationally accepted rules of the applicable symbology specifications and ISO 15415 and 15416.

  The LVS® 7500 displays a "real-time" graph indicating the overall ISO grade, which allows the operator to see trends in print quality for several hundred labels that were just inspected. When an error is detected, the "real-time" graph changes color. The system can also be programmed to "stop the press" when an error occurs (the appropriate hardware must be purchased for this feature).

- Master to Label Comparison (Blemish Detection). The LVS® 7500 Master-to-Label Comparison module, also referred to as blemish detection, identifies and tracks potential print errors such as die cut errors, broken letters, skews, smears, spots, voids, wrinkles, missing copy, and other print quality defects. The Master-to-Label Comparison module also includes an "ignore area" function which accounts for variable image data within a pattern-matching zone and does not report them as blemishes. All inspection is completed at press/rewinder speed. Minimum point size is based on your system's resolution.

- Optical Character Recognition (OCR). Unlike the OCV Module, this module "reads" characters and reports the data content. This data is typically variable and the content remains unknown until it is read. It is important to note that the system can be trained to know what to expect for every character position. In other words, the software can be programmed on what characters to expect: alpha, numeric, or special characters. Many fonts are used in the printing industry. The LVS® 7500 is designed to learn new fonts as necessary.

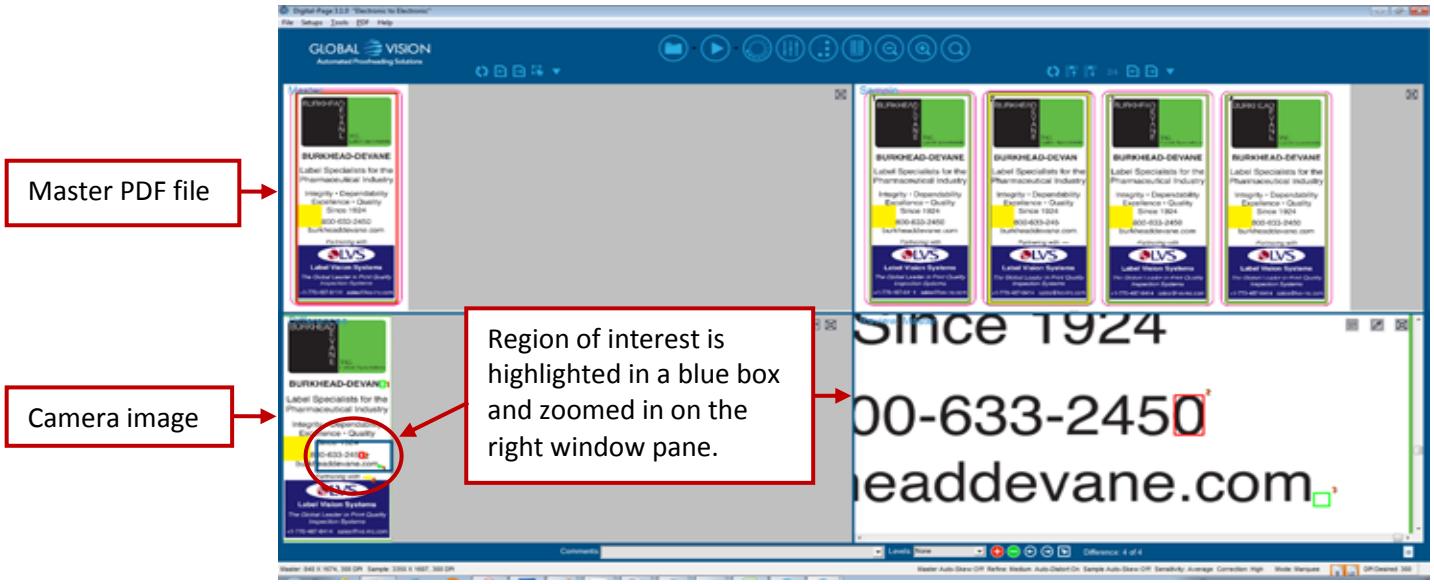
- Optical Character Verification (OCV). The LVS® 7500 OCV module verifies human readable characters at unparalleled speeds at point sizes as low as four printer points (one printer point is defined as 1/72nd of an inch or .35 mm). The LVS® 7500 OCV module ensures that a string of sequential alpha-numeric characters are verified against a known field or database. In other words, you program the software to detect what characters should appear and the software reports if the characters actually appeared. The software will also return a percentage score as to how well the character(s) matched to the trained character(s).

- Number Validation. Verifies the expected order of any numerical series, detects duplicates and sequence errors, and matches variable numbers with external data files.

- Data and Code Matching. Verifies encoded data that represents human readable information and ensures synchronicity of multiple fields within a label.

- PDF Comparison. The PDF Comparison module inspects an approved PDF artwork file against an image taken from the LVS® 7000 to inspect for differences by the operator. The operator can generate a report for Quality Assurance/Quality Control purposes to set a "Pass" or "Fail" status to indicate whether to continue with the print job. The PDF Comparison module is an optional feature and available at an additional charge. Contact your LVS® representative for pricing details. The PDF Comparison module is not supported in Windows® XP or Windows® Vista.

  Below is a sample screenshot displaying the approved PDF artwork and camera images taken from the LVS® 7000.



AESTHETICS

The LVS® 7500 is custom designed to integrate with thermal and thermal transfer printers and other slow-speed roll printing applications.

Adjustable stainless steel mounting brackets allow the readhead to be mounted and matched to the height of the printer.

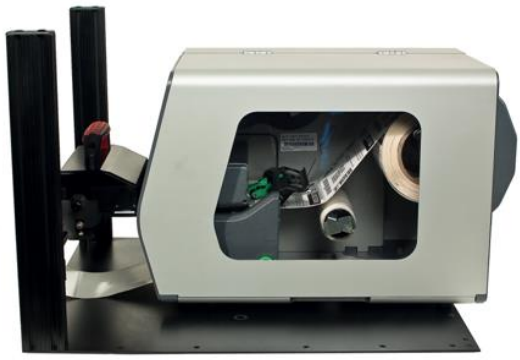
The user's printer is placed onto the steel base plate where the printhead aligns to the LVS® 7500 readhead.

A standard USB cable connects the LVS® 7500 to the user's computer onto which the system software is loaded.

The LVS® 7500 can be configured for use with:

- Printer's internal rewind
- User's external rewind
- Short run jobs without using a rewind
- Motor-driven take up nip roll designed for fan-fold systems
- HMI option designed to interface with multiple LVS® 7500 systems

The LVS® 7500 provides an output signal to stop the printer or warn the operator based on customer specified parameters. All system components are designed for use in an industrial environment.

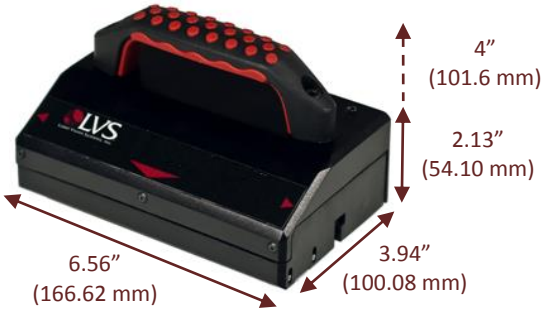


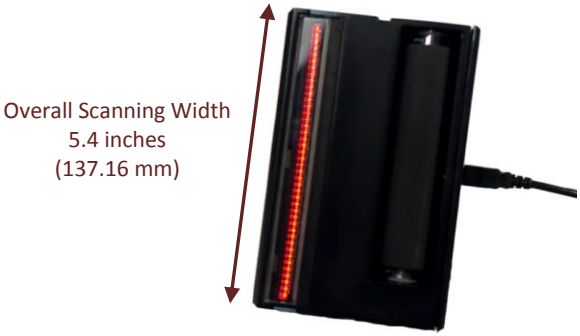
READHEAD PHYSICAL PROPERTIES

The LVS® 7500 is available with a **5.4" (137 mm)** or **8.5" (216 mm)** readhead.

LVS® 7500 5.4" (137 mm):

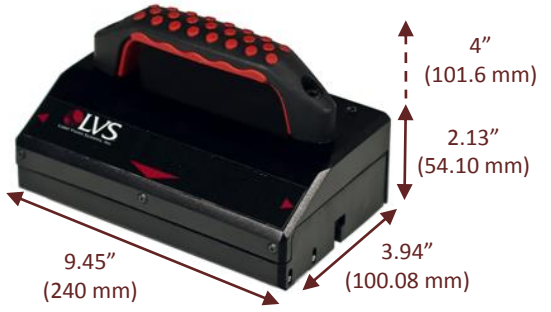
- Height: 4 inches 101.6 mm
- Length: 3.94 inches 100.08 mm
- Width: 6.56 inches 166.62 mm
- Weight: 2.3 pounds 1.04 kg
- Maximum readable label width: 5.4 inches (137 mm)
- Maximum width of web: 5.7 inches (145 mm)





LVS® 7500 8.5" (216 mm):

- Height: 4 inches 101.6 mm
- Length: 3.94 inches 100.08 mm
- Width: 9.45 inches 240 mm
- Weight: 3.1 pounds 1.41 kg
- Maximum readable label width: 8.5 inches (216 mm)
- Maximum width of web: 9 inches (229 mm)



FUNCTIONAL CHARACTERISTICS

The characteristics listed below apply to the LVS® 7500 5.4" (137 mm) and 8.5" (216 mm) readheads.

Line Scan Camera

- 400 DPI. Floating Sensor Head

Light Source

- Red Light. 660 nm

Inputs / Outputs

- USB 2.0 port. 5-Volt Power Supply

Maximum System Speed

- 12 inches (300 mm) per second

ISO VERIFICATION

Verify	Any combination of linear, matrix or stacked codes to ISO print quality standards including: ▪ Linear (1D) Verifier Conformance (ISO/IEC 15416) ▪ 2-Dimensional (2D) Verifier Conformance (ISO/IEC 15415)
Orientation & Number	Any orientation and number of codes on a label.
Read and Analyze	1D and 2D to published International specifications, with an overall ISO (ANSI) grade.
Minimum Linear (1D) Narrow Bar Width	▪ Read only: 6.3 Mils (.0063") (.160 mm) ▪ Verification: 8.8 Mils (.0088") (.223 mm)
Minimum 2D Cell Size	▪ Read only: 10.0 Mils (.0100") (.254 mm) ▪ Verification: 12.5 Mils (.0125") (.317 mm)
Reporting	Detailed data to be reported is in .csv format for extraction by the end user. Immediate reporting is available for viewing via the monitor and Light Tower if utilized.

Optical Character Verification (OCV)

Minimum Human Readable	.083 inches / 2.12 mm / 6 Printer Points
Read or Verify	Sequential string of alphanumeric characters (numbers 0 to 9 and letters A to Z) against known field or database. Characters must be uppercase and cannot touch or overlap.
Data	Verifies variable and fixed data ascending, descending or from a file.

⚠ IMPORTANT: The LVS® 7500 does not distinguish between touching/overlapping characters; thus, characters must not touch or overlap. The LVS® 7500 reads and/or verifies uppercase characters only.

Blemish Detection

Print faults	Detects skew, smear, print registration, die-cut errors, edge determination and missing information.
Variable Data	Allows user specified variable data within a pattern matching zone.
Red Light (660 nm)	The LVS® 7500 uses red light (660 nm) to detect blemishes; thus, color blemishes in the red spectrum may not be properly detected.
Minimum Point Size	Blemish Inspection: 5 Mils / .005 inches / .126 mm Missing Period: 5 Mils / .005 inches / .126 mm

Number Validation

- Any numerical order requirements such as ascending, descending, or algorithmic series to ensure the numbers are in the expected order
- Use external data file for the validation of random number sequence
- Detects duplicate numbers

Matching

- Matches decoded data from a barcode to human readable text of that barcode
- Matches multiple fields of data within the label area being inspected

SUPPORTED SYMBOLOGIES

Below are a few of the symbologies supported by the LVS® 7500. Contact LVS® for a full list of supported symbologies.

Aztec
Codabar
Code 128
Code 39
Code 93
Data Matrix
DataBar expanded
EAN-13
EAN-13 (2-digit supplemental)
EAN-13 (5-digit supplemental)
EAN-8
ECC-200 Data Matrix
GS1-128
GS1 Databar Limited
GS1 Databar Stacked
GS1 Databar-14
GS1 Data Matrix
Interleaved 2 of 5 (ITF)
Laetus Pharmacode
Micro QR Code
MicroPDF417
PDF417
QR Code
UPC-A
UPC-A (2 digit supplemental)
UPC-A (5 digit supplemental)
UPC-E
UPC-E (2 digit supplemental)
UPC-E (5 digit supplemental)
All applicable GS1 composite components

INTERNATIONAL STANDARDS

- ISO/IEC 15415
- ISO/IEC 15416
- ISO/IEC 15426 – 1 and 2
- All supported ISO/IEC symbology specifications

System Features

Auto Setup

The software automatically identifies label fields allowing for rapid setup and change-over.

Job Retrieval

Quickly access previous jobs to run again, or apply or modify formats for new jobs.

Alarm Matrix

Multiple output options for error notification including stop relay, light stack, and on-screen warning set to user-defined thresholds.

Security

- Multiple password security levels
- 21-CFR Part 11 Compliant Ready
- Audit trail for system interaction

Data Management

- Job data archived and stored in CSV file format for ease of export
- All records are date, time stamped and automatically archived
- Remotely review errors and record acceptance or rejection action
- Run summary report for quality control and customer assurance

Sensitivity

Each functionality has its own user-defined sensitivity bar to set the level of variances that are accepted by the system.

⚠ **Important:** Although the LVS® 7500 is the best in print quality technology, there may be some limitations to consider. Please contact your LVS® representative to discuss any questions or concerns about the following:

- Print and present of small labels
- Thick adhesive
- Clear labels
- Labels not on a take-up roll (internal or external)
- Bad registration on overprinting
- Low print contrast

Label Rewinders

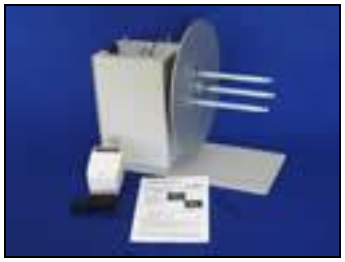
Label Rewinders wind up labels into a roll as they come out of a printer. If you do not use a rewinder, you have to gather up the labels by hand once the printing job is finished.

LVS® offers two full size, heavy-duty label rewinders that can be configured for use with the LVS® 7500 (see table below). To select a rewinder, you must answer the following three questions:

1. What core diameter(s) do you want to use to wind up your labels?
2. How wide are your labels?
3. How large a roll diameter do you want to be able to wind up?

If you are unsure which rewinder is best for you, contact your LVS® representative who can help determine the correct rewinder for your labels.

With an unmatched 5-Year Parts and Labor Limited Warranty, both rewinders are designed for worry-free operation. The rewinders are easy to set up and silent in operation.

Rewinder Part Number	Description
REW3-ACH 	▪ 1" to 4" (25.4 mm to 101.6 mm) Adjustable Core Holder ▪ Core Diameter - 1" to 4" (25.4 mm to 101.6 mm) ▪ Label Width - Up to 6" (152 mm) ▪ Roll Diameter - Up to 11" (280 mm)
REW3-8 	▪ 8.6" (220 mm) wide "Quick-Chuck" and two label Flanges ▪ Core Diameter - 3" (76.19 mm) ▪ Label Width - Up to 8.6" (220 mm) ▪ Roll Diameter - Up to 12" (305 mm)

STANDARD CONFIGURATION

Items included with purchase of the LVS® 7500 include:

- LVS® 7500 Installation CD (includes LVS® 7500 software and "LVS® 7500 Operations Manual")
- "LVS® 7500 Installation and Quick Start Guide"
- LVS® 7500 Readhead (5.4"/137 mm) or (8.5"/216 mm)
- Calibration Card (NIST Traceable)
- Base Plate
- Mounting Bracket with attached Internal Rewind Bar
- Docking Plate
- USB Cable 2.0 Certified (6 feet) (1.8 m)
- Power Supply (5 Volts). Requires localized power cord for shipments outside North America
- AC Line Cord (for North American customers only)
- Stop Motion Interface Unit (customer may purchase optional Light Tower Interface Unit instead of Stop Motion Interface Unit)
- 5/32" Allen Key

Optional Items:

- 5.4" (137 mm) or 8.5" (216 mm) Read Head
- Light Tower Interface Unit. Replaces Stop Motion Unit. Provides color-coded warning lights to operator.
- Motor-driven take up nip roll (designed for fan-fold)
- HMI (Multi LVS® 7500 system interface and display)
- Table top label rewinder (winds up labels into a roll as they come out of a printer). Two available options:
  - 1" to 4" (25.4 mm to 101.6 mm) Adjustable Core Holder
  - 8.6" (220 mm) wide "Quick-Chuck" and two label Flanges

Customer-Supplied Items

- Two screws (8-32 or M4) for Stop Motion Unit mounting
- Two screws (8-32 or M4) for Light Tower Interface Unit mounting (if purchased)
- Flathead screwdriver (to adjust roller tension, if needed)
- Thermal Printer

⚠ If interfacing the LVS® 7500 to the printer for stop motion capabilities, refer to the "Stop Motion Printer Interface Requirements" section below for important printer requirements.

- Computer (see "Minimum Computer Requirements" below)
- Internal or external rewind is required to properly feed the labels for inspection. Lack of a rewind will remove any responsibility from LVS®.
- Training: For United States customers, LVS® installation training is held at LVS® corporate headquarters in Peachtree City, Georgia, USA. Contact your LVS® representative for additional details.
  For customers outside the United States, contact your local LVS® distributor for training information.
- Mains power supply cable (for customers outside United States; this cable connects the power supply box to the wall power outlet)

Minimum Computer Requirements

The user is responsible for supply of computer and monitor onto which the LVS® Engineer will load the system software during installation. The minimum requirements for the computer and monitor are:

- Intel® Core™ 2 Duo Processor or equivalent (Intel® Core™ 2 Quad is preferred)
- 2 GB RAM (4 GB is preferred)
- 80 GB Hard Drive (500 GB preferred)
- 1280 x 1024 Screen Resolution
- Windows® 7 Professional, Windows® 8.1 Professional, and Windows® XP Professional. Windows® Vista is not supported
- Two available USB 2.0 ports (required for the Read Head and Stop Motion Unit/Light Tower Unit)

➡ **Important:** A desktop or laptop computer may be used as long as the computer meets the aforementioned requirements.

Stop Motion Printer Interface Requirements

If interfacing the LVS® 7500 to a printer for stop motion, the user is responsible for ensuring the printer and printer supplier meet the following requirements:

- The printer is capable of stopping from an external signal supplied by the LVS® 7500; not all printers are capable of performing this function.

- The printer supplier can assist the user with interface cards, connectors and printer settings needed to accept the external signal from the LVS® 7500. LVS® supplies an unterminated 5V cable (active high, active low) as the only connection to the printer.
- The printer must be completely setup and functional, including all interface and printer settings, prior to installing the LVS® 7500.

TERMS AND CONDITIONS

WARRANTY

LVS® warrants the quoted system will be free of manufacturing defects for a period of one year from the date of shipment to Customer and will conform with all current specifications at time of product shipment. At its option, LVS® will replace or repair defective goods at no charge. Customer shall pay to ship goods to and from LVS'® facility. If personnel must travel to Customer location, Customer shall bear those travel expenses. **THIS WARRANTY IS IN LEIU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. LABEL VISION SYSTEMS MAKES NO WARRANTY THAT SAID GOODS ARE FIT FOR ANY PARTICULAR PURPOSE, NOR ANY WARRANTY AS TO THE MERCHANTABILITY OR QUALITY OF GOODS SOLD EXCEPT AS HEREIN STATED**. Under no circumstances will LVS® be liable for any special or consequential damages.

TECHNICAL SUPPORT

Technical support is available from your local distributor of LVS® products.

Online support with an LVS® representative is available via the following web-based system: www.gottomypc.com. Customer must have an Internet connection with complete access to the LVS® 7500 system and a licensed copy of the GoToMyPC software installed on the LVS® 7500 system for this service to properly function. Contact your LVS® representative to initiate a GoToMyPC online session.

CANCELLATION

After LVS® accepts your order, the Customer may not cancel the order without LVS'® written consent. In the event of cancellation, Customer shall pay LVS® as liquidated damages all cost incurred by LVS® in connection with the contract, including actual labor and material, and the costs of materials on hand which were acquired or produced in connection with this order, plus an additional 40% of those costs.

PRODUCT RETURNS

Customer may return purchased system within 30 days from date of shipment from LVS® facility. Customer is charged 25% of system purchase price as a restocking fee and shall pay to ship goods to LVS® facility in Peachtree City, Georgia 30269 USA. The system must be returned in the original packaging in which it was received. Customer will be charged for any missing parts or damage to the system.

ABOUT LVS®

For over 30 years, LVS® has designed, developed, and manufactured print quality vision inspection and verification systems, leveraging our patented methodology in bar code imaging and ISO (ANSI) bar code grading. LVS® has installations in over 40 countries and maintains a commitment of excellence to our customers, the print industry and the vision products we produce. LVS® is proud to be ISO 9001:2008 certified; a GS1-US Solution Provider; and our INTEGRA 95XX products are GS1-US certified.

ISO 9001:2008 Certification and 21 CFR Part 820 Compliant (cGMP)

LVS® received ISO 9001:2008 certification from the National Quality Assurance, USA (NQA, USA). The receipt of ISO 9001:2008 registration is the most widely recognized standard for quality management systems. ISO 9001:2008 certification validates LVS'® commitment to all our customers and guarantees that continued improvement and compliance are achieved.

LVS'® manufacturing processes are 21 CFR Part 820 Compliant (cGMP).

Our Products

LVS® products are unique in the world as they inspect variable printed data and bar codes to guidelines established by the International Standards Organization (ISO).

LVS® provides print quality inspection systems for both off-line and in-line applications.

Off-line verifiers are the INTEGRA 95XX Series, which include the INTEGRA 9510, INTEGRA 9570 and INTEGRA 9580 – all designed to fit your vision inspection and bar code verification needs. The INTEGRA 95XX Series of verifiers are unique in the world of ISO verification due to their ease of use and ability to verify linear (1D) and two-dimensional (2D) codes without any change of equipment; autodiscriminate the symbology, narrow bar width and aperture to be used to evaluate the code; and highlight trouble spots in the code. The INTEGRA 95XX Series of verifiers offer numerous, impressive analytical tools used to identify and evaluate bar code problems. The INTEGRA 95XX Series are certified by GS1 US and are 21 CFR Part 11 compliant-ready.

INTEGRA 9510

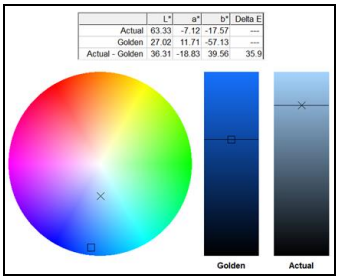
INTEGRA 9570

INTEGRA 9580

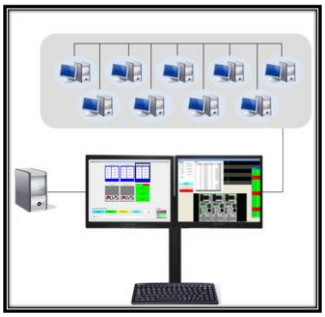
The in-line LVS® 7000 system is a high speed, user-friendly vision system that improves the quality inspection process. The LVS® 7000 verifies to ISO/IEC standards all bar codes and matrix codes as they are printed, validates sequential or random number sequences, as well as fullfills the normal print quality inspection steps. Features include:

- Delta E Color Process Control – Detects color variations by comparing the trained color (also called the master color) to the image color currently displayed in the field of view
- Master-to-Label Comparison (Blemish Detection) – Detects blemishes, smears, skews, missing copy, print registration and edge determination
- Full ISO (ANSI) verification of 1D and 2D Bar codes, including Linear, Data Matrix and Stacked codes. Verifies codes in any orientation
- OCR/OCV Inspection – File Matching; Duplicate Checking; and Random or Sequential Data Validation
- Roll Inspection Mapping System (RIMS) – Linked to the LVS® 7000 or LVS® 7500, RIMS will map and record each error detected on the press
- HMI Command Center – Beneficial for customers needing to view and interact with multiple vision systems in remote locations from a single monitor. The system uses a dual-monitor console to view and fully interact with a maximum of nine LVS® 7000/7500 systems, or non-LVS® systems
- Auto Scan (Web Viewer) – Allows an operator to simultaneously monitor and analyze up to 16 areas of interest per job on the web without having to manually move between each area of interest
- PDF Comparator – Allows the comparison of PDF artwork to the LVS® golden image for the actual print job

LVS® 7000



Delta E Color Process Control



HMI Command Center

The LVS® 7500 offers 100% print quality inspection and bar code verification capabilities for use with Thermal Transfer Printers and other media. LVS® 7500 functions include master-to-label comparison (blemish detection), bar code verification (1D and 2D), bar code validation, OCR, OCV, field matching, and number/data validation.

LVS® 7500

CONTACT LVS®

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