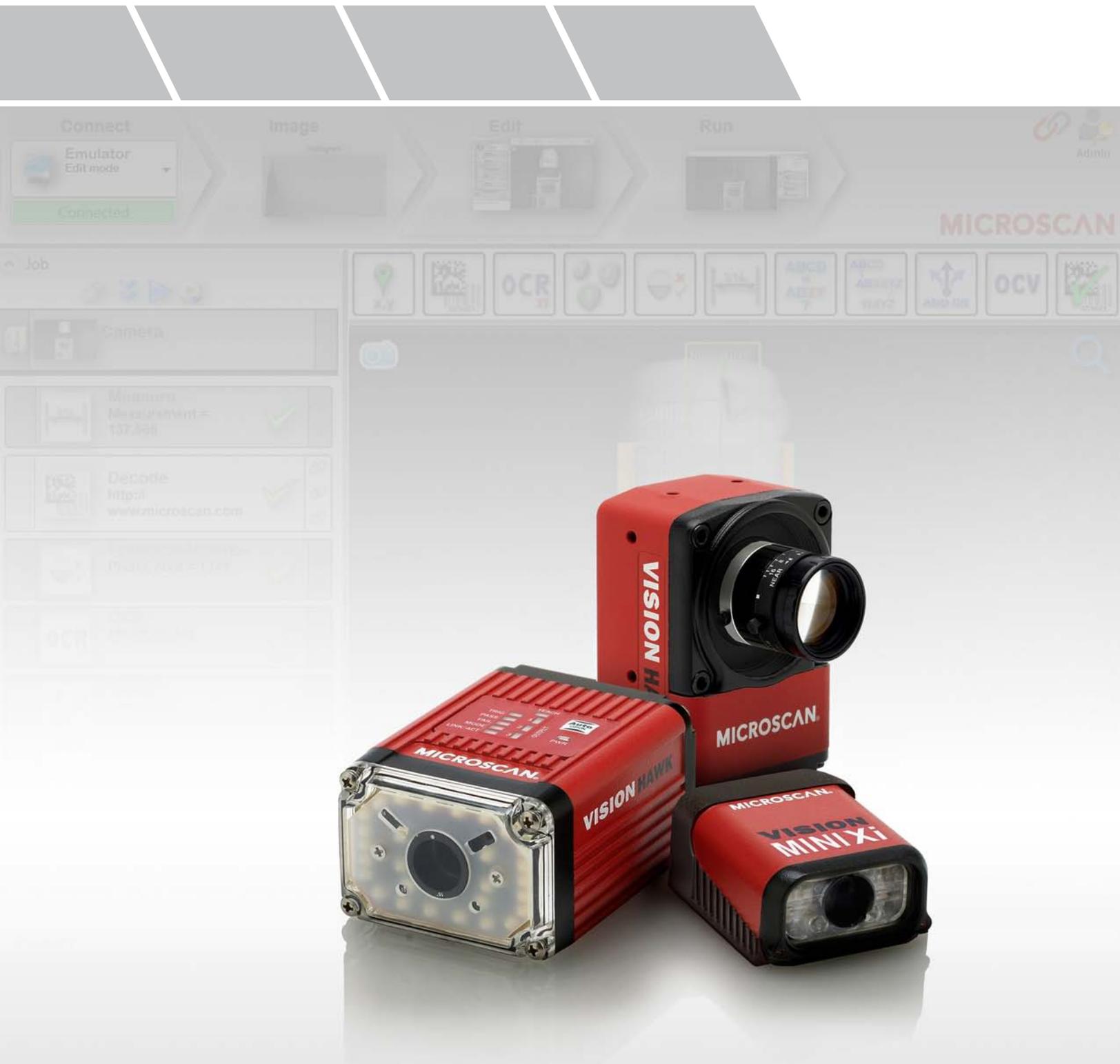


AutoVISION® Machine Vision

Simple, scalable vision system for any application



Reading & Inspection For Any Application

Many industries – from electronics assembly to drug discovery to food & beverage packaging – depend on reliable machine vision for product inspection and identification. The increasing need for higher production output at a lower cost places more stringent demands on manufacturing systems. AutoVISION has helped manufacturers around the world to drive down cost and waste, increase yields, and ultimately meet their track, trace, and control objectives.

Consumer Packaging

Pharmaceutical Packaging

Electronics & Automotive

Lab Automation & Other Life Sciences

What can AutoVISION do for your process?

- Barcode reading
- Barcode quality verification
- Label presence/position
- Inspect package integrity
- Assembly verification
- Error proofing
- Sorting parts
- Quality assurance
- Defect detection
- Measure fill levels
- Safety seal inspection
- Date and lot verification
- Color matching
- Test tube cap and color inspection
- Dimensional gauging
- Absence/presence of parts

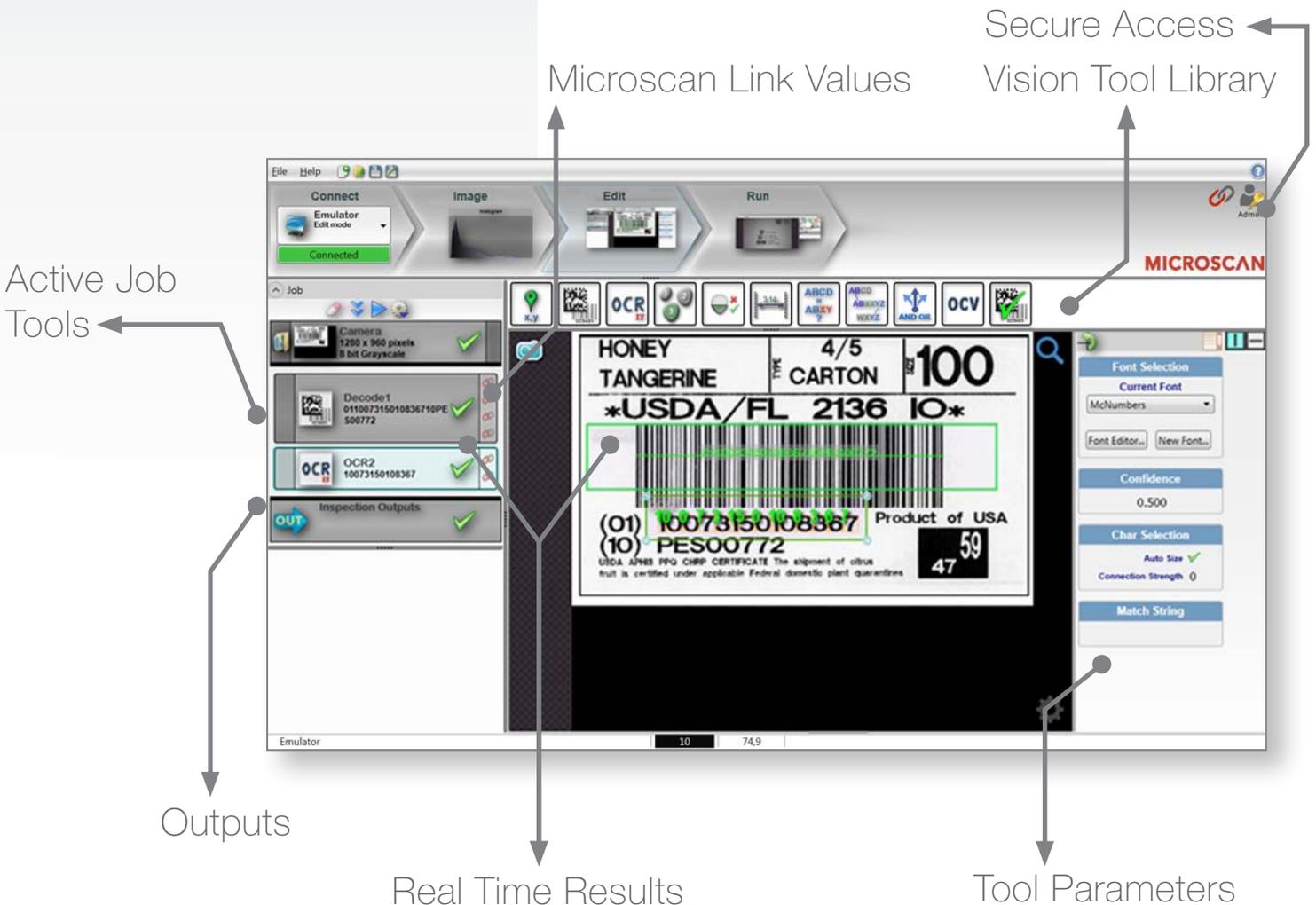


Just four simple steps:

- **1. CONNECT** to a camera or use Emulator mode.
- **2. IMAGE** view is used to acquire and adjust the image.
- **3. EDIT** the job using vision tools and adjusting each parameter. Real time pass/fail results for each tool are displayed.
- **4. RUN** the job and observe the inspection results in action.

Intuitive Interface for Easy Setup & Use

AutoVISION features an intuitive user interface that guides the user to connect to a device, configure the hardware, program the job, and monitor results. Upon start up, it automatically detects all compatible devices and immediately begins configuration. It can also be used in 'emulator' mode with stored images to evaluate applications without connecting to a camera. As a device is being configured or while a user is programming a job, AutoVISION provides real-time feedback and results. Because the runtime interface is built into the user interface, at any point in the process a user can try out a job and determine if the device is configured to meet the application's needs.



Complete Tool Set

AutoVISION's capabilities start with a Locate Tool that is based on pattern matching. The Locate Tool can be used to orient other inspection tools or to detect the absence or presence of complex objects. AutoVISION includes Microscan's powerful X-Mode decoding capability for 1D and 2D symbol reading along with trainable font-based OCR. For inspection and control applications AutoVISION includes simple yet powerful Measure, Count and Presence/Absence Tools. Decode and OCR Tools include links to match string input from serial or TCP ports. Easily validate the quality of printed text such as date/lot codes with Verification and OCV Tools.



- Locate Tool**
 Find the position of a feature in the image



- Decode Tool**
 Decode a barcode or 2D symbol and check GS1 syntax



- Optical Character Recognition (OCR) Tool**
 Read text using built-in or user-specified fonts, including advanced IntelliText algorithms for hard-to-read characters



- Optical Character Verification (OCV) Tool**
 Verify the quality or legibility of printed text



- Symbol Quality Verification Tool**
 Verify symbol quality to ISO 15415, ISO 15416 or AIM DPM / ISO 29158 standards



- Count Tool**
 Count the number of features



- Presence/Absence Tool**
 Look for the presence of a feature



- Measure Tool**
 Measure angles or the distance between two edges



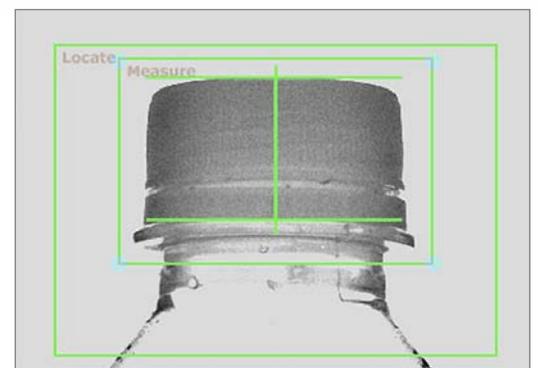
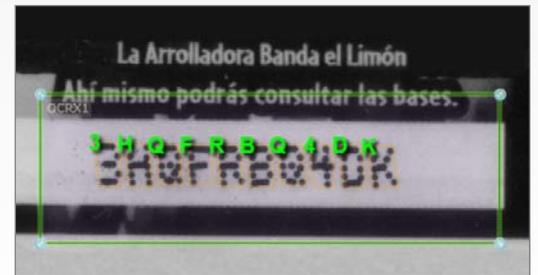
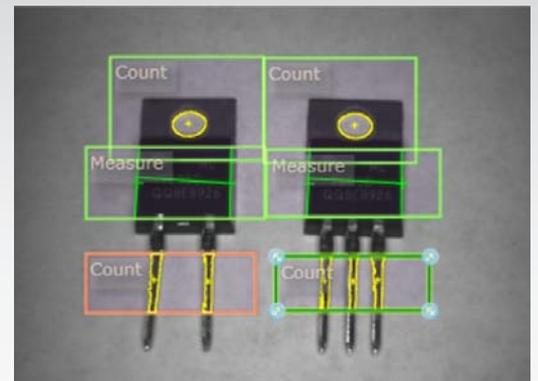
- Logic Tool**
 Combine results into outputs

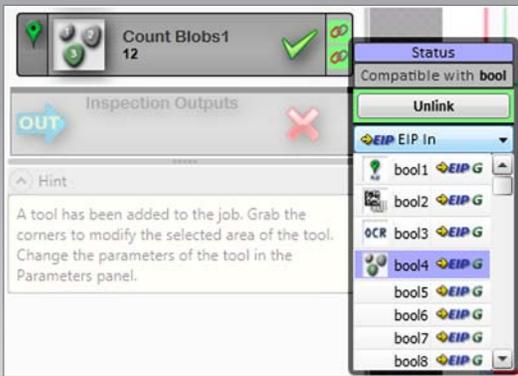


- Match Strings**
 Check that an output string from a tool, such as the Decode or OCR Tool, matches the user-defined string



- String Format**
 Edit strings to prepare them for output

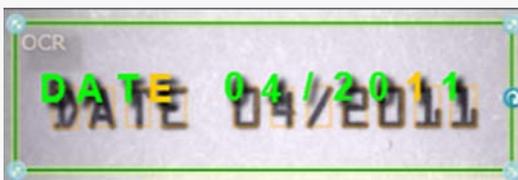




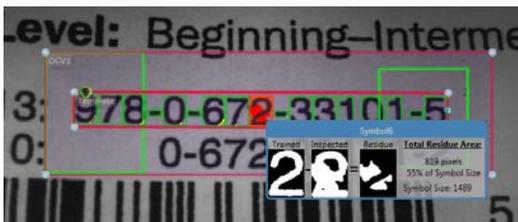
Linking Tool Parameters



Data Navigator Window



OCR Tool – Decode Printed Text



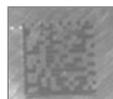
OCV Tool – Quality Inspection



Verification to Global Standards or Custom Parameters



High Quality Symbol Example



Poor Quality Symbol Example

Microscan Link

Microscan Link connects parameters within AutoVISION jobs to industrial control systems and the CloudLink Dashboard. AutoVISION allows you to link tool parameters to tags within the Global Data Service (GDS) and enables seamless integration of a machine vision inspection job into any automation system. From a single PLC to a network of smart cameras, Microscan Link establishes the line of communication between AutoVISION and the entire factory floor.

Direct connection to a PLC system can be created with a single click of the “Link” icon on the desired parameter, simply the easiest vision software connectivity available. Link icons appear throughout AutoVISION editing views, and linkable parameters all have a Microscan Link icon displayed next to them. Visualize and review the Link results in the Data Navigator window.

Barcode Verification & OCV

The quality, legibility, and accuracy of barcodes and printed text can be easily checked with AutoVISION’s powerful tools for both symbol quality verification and text quality verification (OCV). While the OCR Tool determines the content of printed text, the OCV Tool inspects the quality and confirms the legibility of text.

In just a few simple steps, a user can set up a complete verification system, including printed reports, to determine barcode quality at any level of quality grading, including conformance to three global verification standards: ISO 15416, ISO 15415, AIM DPM/ISO 29158. If barcode quality verification to set standards is not necessary, simply modify the parameters for custom validation and ensure consistently readable codes for each manufacturing process. Verification trending and analysis is also available.

AutoVISION not only enables inline verification, where each part produced is verified to a standard, but can also be used within stand-alone verification solutions.

CloudLink



CloudLink technology provides several tools for visualization of AutoVISION data, including the customizable CloudLink Dashboard interface and two pre-created HTML demos. These allow you to view Microscan Link values and images from compatible AutoVISION smart cameras and vision systems, with no need for a separate license or software purchase.

CloudLink Dashboard is Microscan's customizable web-based HMI, displaying AutoVISION runtime data on nearly any web browser to provide real time views and feedback. The interface allows you to easily build HMI views from within the built-in web page, which automatically expands to fill a single browser window to remove scrolling requirements. It runs in a wide variety of modern, HTML5 compliant web browsers, including those found on smart phones and tablets.

Uniquely Scalable

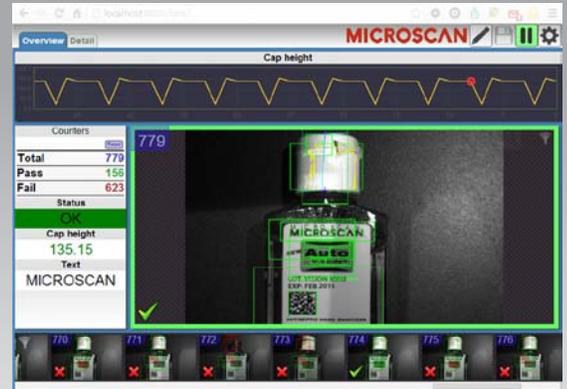
For applications demanding more flexibility or configuration options, easily upgrade to the full functionality of Visionscape, Microscan's machine vision platform for both smart camera and PC-based systems. AutoVISION jobs can be opened with Visionscape FrontRunner enabling scripting and other advanced programming capabilities.



AutoVISION: Novice vision users and common applications



Visionscape: Advanced vision users and complex applications



CloudLink Dashboard Interface

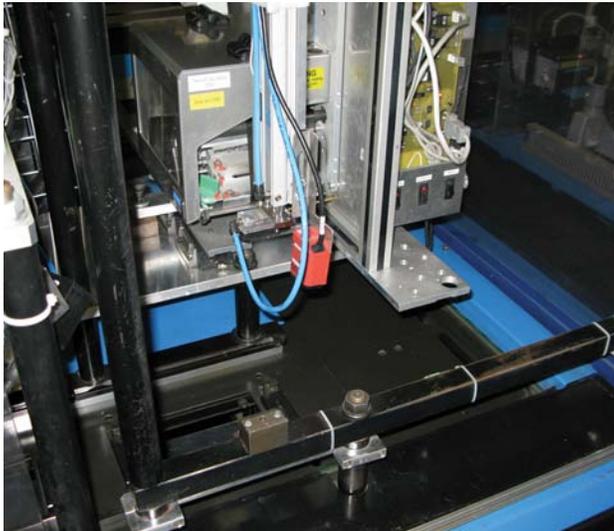
Customizable widgets include:

- Inspection Counters
- Image Filmstrip
- Bar and Line Chart
- Link Values
- Log of Values

Protect your investment with a flexible system:

- Invest in training on a single user-friendly vision system that handles the evolving needs of your application.
- All smart cameras run on the same software with easy job portability – from high speed to industrial C-mount to color detecting models and more.
- Upgrade to advanced vision software and keep the same cameras. Or upgrade to a higher speed PC-based GigE system and deploy the same vision job. Applications can change – but your hardware or software don't have to.

- **Customer:** Continental AG, Czech Republic
- **Application:** Replace existing barcode scanner with smart camera that reads barcodes as well as checking label presence, placement, and print accuracy
- **Products:** Vision MINI smart camera with AutoVISION machine vision software, and NERLITE HI-BRITE external lighting



Customer Success Story: Electronics

While barcode readers are a standard in many industries, many manufacturers are looking to incorporate additional inspection capabilities to address increasingly strict quality requirements. Smart cameras provide the ability to read barcodes and perform inspection with a single hardware solution.

A global automobile manufacturer recently specified a new requirement to this Tier One supplier facility: verify the position and print quality of each label on its subassemblies for accuracy. After searching for a solution that was cost-effective; could be easily incorporated into their existing processes and the limited space of an x/y gantry; and could communicate to a PLC via RS-232, the customer decided to replace its existing laser barcode scanner with the compact Vision MINI smart camera with AutoVISION software. An external lighting source (NERLITE HI-BRITE 45) is used to further enhance mark contrast on the monochromatic parts. The implementation of the AutoVISION system provided a seamless transition to vision technology in Continental's assembly line, enabling easy replacement of the original laser barcode scanner without the need to reprogram the PLC.

Customer Success Story: Packaging

Petroleum and petrochemical manufacturer Sinopec Group, headquartered in Beijing, is a large producer of automotive and industrial lubricants. Because bottles are labeled before filling and are loaded by hand onto assembly lines, an incorrect or missing label occasionally makes it onto the line. The system required a data capture solution for both 2D codes and text characters on the bottle labels, as well as linear barcodes on the products' secondary packaging.

The Vision HAWK C-mount smart camera was installed on the lines to detect the presence/absence of each label by reading a printed 2D code, to read the label's OCR text and validate its contents, and to report the results back to the information management system. The bottles are then packaged in cases tracked with a printed 1D barcode.

- **Customer:** Sinopec Group, China
- **Application:** Confirm presence and accuracy of labels on lubricant bottles on production line for verification and product traceability
- **Products:** Vision HAWK C-mount smart camera



Customer Success Story: Pharmaceutical

AutoVISION machine vision systems were selected for integration into a packaging inspection solution to help one of the world's leading pharmaceutical companies comply with European anti-counterfeiting regulations.

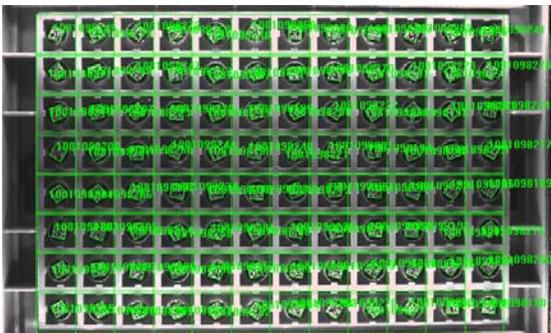
A local Microscan Partner specializing in pharmaceutical applications developed the comprehensive printHawk solution for printing and controlling production data specifically for the pharmaceutical industry. The printHawk solution prints a 2D Data Matrix symbol, as well as the production data in text format. Then the data and print quality are inspected and validated by a Vision HAWK smart camera with AutoVISION software.

The Vision HAWK captures an image of the product packaging and processes the data to validate the information printed on the products. During validation, the same Vision HAWK smart camera decodes the Data Matrix symbol and reads the OCR text, identifying and comparing this information with the required production data. In case of an error, the faulty boxes are immediately removed from the conveyor system and the rejection is confirmed.

- **Customer:** Boehringer Ingelheim, Greece
- **Application:** Ensuring Data Matrix symbol presence and validating readability of text (OCR) on pharmaceutical packaging
- **Products:** Vision HAWK smart camera and AutoVISION machine vision software, integrated into printHawk all-in-one solution from Microscan partner



- **Customer:** Friedrich Miescher Laboratory (FML), Germany
- **Application:** Integrated vial reading solution to reliably decode, display and transmit 96 Data Matrix symbols on bottom of each tray
- **Products:** Vision HAWK C-mount camera with integrated machine vision software, enclosed in custom-made case from Microscan partner



Customer Success Story: Lab Automation

Laboratories such as the Friedrich Miescher Laboratory (FML) often use 96-well trays, which allow researchers to organize tubes while adding sample and mix. A tray contains 96 small tubes or vials with a high density Data Matrix symbol printed on the bottom of each. The Friedrich Miescher Laboratory needed a reliable solution to decode all 96 symbols in a single pass, and then transmit the data via an Ethernet connection in a fast and efficient way.

With a custom-made case to accommodate the machine vision solution, a Vision HAWK C-mount smart camera with a WUXGA sensor and integrated software was chosen as the ideal means to achieve the necessary field of view. Additional rows of bright white LEDs were included on the top of the case to ensure a consistent light field for precise detection of all 96 symbols. The decoded data is sent to a CSV file, which can be used in any way the customer desires.

AutoVISION Software & Hardware

AutoVISION Software

For Novice Users and Basic to Mid-Range Applications



■ Complete Tool Set

Includes Microscan's X-Mode 1D/2D decoding and fully teachable OCR, along with Locate, Measure, Count and Detect tools. Verification and OCV tools validate quality of printed text such as date/lot codes.

■ Microscan Link

Connects job parameters to industrial control systems or to a PLC system with a simple click.

■ CloudLink

Customizable web-based HMI displays AutoVISION run-time data on nearly any web browser to provide real time feedback and visualization.

■ Scalable to Visionscape (See Below)

Open jobs with Visionscape Fronrunner for more flexibility, including custom scripting.

Capabilities:

- 1D/2D symbol decoding
- OCR & OCV
- Dynamic part location
- Assembly verification
- Dimensional measurements

Visionscape Software

For Advanced Users and Complex Applications



■ FrontRunner Interface

"Engineering" GUI provides a visual approach to application development, training and evaluation using an intuitive tree structure for maximum flexibility.

■ IntelliFind®

Geometric pattern match tool for robust pattern location and pattern recognition in noisy images; includes rotation and scale measurement.

■ VsKit.NET

Provides modules to make vision inspection an integral part of a machine setup interface by incorporate machine vision capabilities into any .NET program.

■ GigE

Camera interface standard using Gigabit Ethernet communication protocol to allow fast image transfer using standard network components and long cable lengths.

■ Microscan Link

Connects job parameters to industrial control systems or to a PLC system with a simple click.

■ CloudLink

Customizable web-based HMI displays Visionscape run-time data on nearly any web browser to provide real time feedback and visualization.

Capabilities:

- *All AutoVISION capabilities*
- Image transformation and scaling
- Precision calibration
- Custom vision tools (scripting)

AutoVISION Software & Hardware

Vision MINI Smart Camera

World's Smallest Fully Integrated Vision System



- Smallest fully integrated smart camera:
 - 1 in (25.4 mm) x 1.8 in (45.7 mm) x 2.1 in (53.3 mm)
 - 2 oz (56 g)
- Ideal for implementing robust inspection in tight spaces
- Includes high resolution and color models

FEATURES:

- Integrated lens, lighting & cable
- Autofocus
- Lightweight
- Ultracompact size
- RS-232 & USB 1.1

Vision MINI Xi Smart Camera

Fully Integrated Miniature Industrial Vision System



- Smallest fully integrated smart camera:
 - 1 in (25.4 mm) x 1.8 in (45.7 mm) x 2.1 in (53.3 mm)
 - 3.2 oz (91 g)
- Integrated Ethernet and serial connectivity, 24 V interface, and optically isolated I/O
- Includes high resolution and color models

FEATURES:

- Integrated lens, lighting & cable
- Autofocus
- Ultracompact size
- 24 V interface
- Ethernet TCP/IP & RS-232

Vision HAWK Smart Camera

Fully Integrated Industrial Liquid Lens Vision System



- Liquid lens autofocus & high resolution, modular optical zoom system
- Industrial connectors & IP65/67 rated enclosure
- On-board optically isolated I/O connections for trigger and results
- Integrated Ethernet networking for high speed communication
- Includes high speed and color models

FEATURES:

- Integrated lens & lighting
- Autofocus
- IP65/67
- Built-in I/O
- Ethernet TCP/IP, Ether-Net/IP, PROFINET I/O & RS-232

Vision HAWK C-Mount Smart Camera

Flexible Industrial Vision System



- Right-angle C-mount lens configuration
- Maximum flexibility in any automation environment
- Industrial connectors & IP65/67 rated enclosure
- Includes high speed, high resolution, and color models

FEATURES:

- Interchangeable C-mount lenses
- IP65/67
- Built-in I/O
- Ethernet TCP/IP, Ether-Net/IP, PROFINET I/O & RS-232

GigE Cameras: AutoVISION jobs can be saved and loaded onto any GigE Camera running Visionscape software.

AutoVISION Software & Hardware Smart Camera Comparison Tables

	Vision MINI			Vision MINI Xi		
Sensor	1/2 inch	1/2 inch	1/2 inch	1/2 inch	1/2 inch	1/2 inch
Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Resolution	752 x 480	1280 x 1024	2048 x 1536	752 x 480	1280 x 1024	2048 x 1536
Frame Rate	60 fps	15 fps	5 fps	60 fps	15 fps	5 fps
Shutter	Global	Rolling	Rolling	Global	Rolling	Rolling
Color			X			X
Lens	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Lighting	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
i/O	3 out/2 in	3 out/2 in	3 out/2 in	3 out/2 in, optoisolated	3 out/2 in, optoisolated	3 out/2 in, optoisolated
Connectivity	RS-232 USB 1.1	RS-232 USB 1.1	RS-232 USB 1.1	RS-232 Ethernet TCP/IP	RS-232 Ethernet TCP/IP	RS-232 Ethernet TCP/IP
Software	*AutoVISION	*AutoVISION	Visionscape ONLY	*AutoVISION	*AutoVISION	Visionscape ONLY

* Visionscape and Verification/OCV upgrades available.

	Vision HAWK			Vision HAWK C-Mount			
Sensor	1/3 inch	2/3 inch					
Type	CMOS	CCD	CCD	CMOS	CCD	CCD	CMOS
Resolution	752 x 480	1280 x 960	1280 x 960	752 x 480	1280 x 960	1280 x 960	2048 x 1088
Frame Rate	60 fps	20 fps	20 fps	60 fps	20fps	20fps	48 fps
Shutter	Global						
Color			X			X	
Lens	Built-in	Built-in	Built-in	C-mount	C-mount	C-mount	C-mount
Lighting	Built-in	Built-in	Built-in	External	External	External	External
i/O	3 out/2 in, optoisolated						
Connectivity	RS-232 Ethernet TCP/IP EtherNet/IP PROFINET I/O						
Software	*AutoVISION	*AutoVISION	Visionscape ONLY	*AutoVISION	*AutoVISION	Visionscape ONLY	*AutoVISION

* Visionscape and Verification/OCV upgrades available.

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